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COMPUTER WEEKLY

Olivetti nears systems goal

WORLDWIDE orders for 13,000 TC 800 terminal systems, worth more than £100 million, point to the increasing success of Olivetti's strategy to establish itself as one of the leading suppliers of data entry and computer network equipment.

The company's turnover is now divided 40-60 between such systems and office products, and the next goal is to achieve a 50-50 divide.

This will be brought nearer by the introduction next year of a text processing system based on the Lexicon "golf ball" print mechanism, the micro floppy disc unit used in the P6060 mini, and new keyboard and memory units.

Major TC 800 orders in the pipeline and at an advanced state of development include a big network for the South African Post Office involving SP 600 minis, and about 500 TC 800s and the new TC 480 printer terminal.

Two major banking orders have come from the Canadian Imperial Bank of Commerce which is to have a network of 1,400 TC 800s, and 1,000 are to go to the Commercial Bank of Italy. Olivetti is also supplying equipment and helping to develop a terminal network for the Greek Post Office.

Giving details of Olivetti's successes in these fields, its corporate marketing manager, Massimo Samaja, said that in the first eight months of 1977 the group's consolidated turnover had been 745.9 billion lire, (£480 million) an increase of 23.9% on the same period last year. The increase in orders for the same period was 24.9%.

Samaja was speaking at a presentation of two key Scandinavian orders, a network of 180 TC 800s for the STS, the Finnish Workers' Savings Bank; and a network of TC 480 terminals for the Norwegian State Railways.

In the financial field, he said, Olivetti now had 63,000 systems in credit institutions worldwide, and equipment for the banking market was shortly to be extended with the TC 800 ATS automatic teller system and the DE 700 data entry and transmission systems that were launched at Sicob in Paris.

Dealing with the question of user resistance to IBM's SNA protocol, Samaja said that an SDLC working prototype was due to go live for an Australian customer by the end of the year, and a second would be installed in Italy shortly afterwards.

Work was also in hand on software to provide for TC 800 connections to the SWIFT network.

The Finnish Saving Bank order was won in competition with Burroughs, Nokia of Finland, Datasaab and Philips. IBM dropped out at an early stage because it wanted to provide a complete package and the system was already well established on a dual Burroughs B3500 system. Of the 180 TC 800s ordered, worth a total of about £1,300,000, 136 are already in operation.

NEWS IN BRIEF

French firms to merge

TWO French companies specialising in terminal systems, Transac and Sintra, are to merge as part of a growth contract signed with the French government. At present the companies, which are both part of the CGE electronics group, produce competitive systems, Transac under licence from Incoterm, and Sintra from original designs.

The government growth contracts were announced last year and are granted in return for commitments on growth, employment and exports. Sintra and Transac have agreed on a growth rate of 30% a year and an expansion of exports of 50% a year over the next three years.

Bank gets Amdahl

THE fourth Amdahl 470V/6 in Europe is now up and running at Crédit Suisse in Zürich, where it will run loosely coupled to the bank's three IBM 370/168s.

£1.5m order

NATIONAL Westminster Bank has ordered 24 NCR 775/2100 multi-pocket proof and encoding systems, and 24 NCR 781 cassettes, valued at nearly £1.5 million. The systems are used in the initial processing of cheques and other documents, including coding the documents with Magnetic Ink Character Recognition, MICR, characters.

On the move

IN a bid to combine most of its London staff under one roof, Univac has moved its offices to Brentfields, opposite Stonebridge Park railway station, Wembley. Its new address is: The Sperry Univac Centre, London NW10 8LS. Tel: 01-965 0511.

CSA shows high cost of privacy

THE costs of complying with proposed legislation aimed at protecting personal information are underlined in technical guidelines drawn up by the Computing Services Association.

And the costs will not be limited to amending computer systems but will also be affected by clerical changes that will be needed.

The guidelines say, "Some of the techniques and methods of work which have been accepted over the years within the organisation for its computer-based systems will have to be changed to meet the new environment."

The changes, says the CSA, could include the introduction of encryption techniques to ensure the privacy of transmission lines; the systems analysis and programming of changes to systems to bring them in line with legislation; and possible reviews of operating systems to ensure that they meet security criteria.

One significant point highlighted by the CSA is that of giving the individual access to information held on him: "A management and clerical procedure will have to be developed to cope with this inquiry and staff trained to handle it, including identification methods and confirmation of data by the subject. In many cases client as well as employee relationships could be affected by the quality of response."

The Swedish experience, says the CSA, shows that less than 5% of people want to inspect data held on them, which means that for a system with 100,000 personal records there could be 20 inspections and four or fewer corrections in a day.

However, to meet the requirements of the law, it may be necessary to keep a full log on computer files, so that the relevant parts can be found.

The first division of Computer Weekly's summer soccer league was won by Jadpu, the London-based Joint Authorities Data Processing Unit of the Home Office and the Metropolitan Police. Its captain and top scorer Alan Patterson (right) is seen here receiving the cup from CW editor Malcolm Peltu at a celebration dance last week. Champions of the second division were recruitment consultants Datascope who received the Eurologic Cup from Eurologic director Terry Wright. Allergo won the third division Wellorex trophy presented by Graham Hollott, a director of Wellorex.

Improving 370 performance

ANOTHER product aimed at improving the performance of IBM 370 installations has been released in the UK by Westinghouse. Known as Faqs (Fast Queuing System), the software was originally developed by US company Goal Systems.

Faqs re-orders the queue of I/O requests to direct-access disc devices, so as to minimise disc-head movement from one request to the next.

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Release of Army's Coral

FURTHER competition in the potentially lucrative Coral 66 market has come from Digital Equipment PDP-11 users.

A Coral compiler for the machine, originally developed at the Royal Military College of Science, Shrivenham, has been made generally available for the first time through Hugh Pushman Associates of Poole, Dorset.

A new division of the company, Hugh Pushman Associates (Compilers) has been formed to market the DEC Coral and to support its existing users.

The division plans to diversify into other languages and other machines, offering source-compatible compilers across a wide range of mini and microprocessor hardware. Next hardware to be approached will be the Computer Automation LSI-2.

The Shrivenham compiler has about 20 current users, mostly developers of software for the Ministry of Defence. These have, until now, been unsupported.

Modems monopoly

FOLLOWING the Post Office concession that TV sets may now include integral modems for Viewdata, John McNulty of Modular Technology, has been advised by the Post Office that the Post Office monopoly on other modems remains in force. "Perhaps if I gave away cheap Japanese TV sets with each modem, I could get round the problem," comments McNulty.

ANNOUNCEMENT

A Member of the Computing Services Association is offering exclusive rights to a new job costing and accounting package within (a) the United Kingdom and (b) Europe.

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Briefing

Big DEC price cuts

MANUFACTURING economies have enabled Digital Equipment to cut its prices by up to 21% on eight of its packaged PDP-11 configurations, including discs and operating systems.

The maximum price cuts of each model are — up to 20% on large 11/70 systems; 10% on the large 11/60s; 13% on the small 11/60; 15% on a large 11/34; 21% on a small 11/34; 20% for the 11/04; 18% for a large 11/03; and 18% for a small 11/03.

£10m order

ORDERS for 10 3032 and 3031 systems, worth a total of £10 million, have been placed with IBM by United Leasing. The company also has two 3033s on order and expects to place most of the machines in Germany. IBM normally operates a first come first served system for hardware reservations, but it is understood orders taken during the first week of marketing of the new machines were consolidated and the delivery sequence decided by lottery.

Crash crisis

HARDWARE and software crashes on the ICL 2980 at the regional computing centre at Edinburgh University are still preventing the centre from providing a full service. The mean time between crashes has worsened from 3.9 hours in July (CW, July 14) to 2.0 hours. The situation has been brought to the attention of ICL managing director Geoffrey Cross and is getting special attention.

Burroughs' bid

IN response to IBM's 3031 processor Burrough's has announced a new 6800 multiprocessor model, the 6817, in the US. It has a minimum configuration of 2 Megabytes of main memory and costs $975,000. Deliveries begin next spring. Mainframe Challenge, Page 48.

CMC taken over

US MINIMAKER Microdata has completed negotiations to buy 75% of key-to-disc manufacturer CMC UK for $4 million, but has abandoned plans to buy CMC France and CMC Germany. CMC UK has subsidiaries in Sweden and Denmark and Microdata will market through distributors for the rest of Europe.

Scanner plan

WEST Midland Regional Health Authority seems likely to approve the purchase of a £320,000 body scanner for Coventry's Walsgrave Hospital. The authority was recommended at its meeting yesterday (Wednesday) to set aside £100,000. The balance of £220,000 is being raised by public subscription. Greatest advance since X-rays, page 20.

VS Wang 2200

A VIRTUAL storage version of the 2200 series computer has been introduced in the US by Wang Laboratories. Current plans indicate that the machine will not be appearing in Europe for at least six months.

CW ball raises over £1,000 to aid disabled

At Computer Weekly's second annual charity ball last Friday, over 600 people from the computer industry dined and danced at the Royal Lancaster Hotel, and helped to raise well over £1,000 for the BCS Specialist Group for the Disabled.

Guest of honour at the ball was the BCS president, Professor Paul Samet, who accepted the contribution to the group's funds from Computer Weekly's editor, Malcolm Peltu. He also announced that the National Computing Centre had donated three training courses to the specialist group. The courses are on video and audio tape and cover Filetab, Cobol programming and the implications of computer systems. They are for use at Stoke Mandeville Hospital where a machine has been presented by Philips. The audio courses can be used on normal cassette recorders and the hospital could make good use of some more units. Anyone who has a recorder or player to give or loan to Stoke Mandeville should contact Derek Nicholson.

Left, Professor Samet chats with two members of the specialist group, Margaret Pearce and Tony Oates. On the left are Professor Samet's wife, Joan, and Christiane Higgins, wife of Tony Higgins, Computer Weekly's deputy editor, who organised the ball.

Strike threat to Govt installations

By Robin Webster

COMPUTERS and computer staff are at the centre of a number of industrial relations problems this week, with a threat to government computer installations by Civil Servants likely to be the most far reaching.

The Society of Civil and Public Servants, which represents the executive civil service grades, including DP staff, is threatening industrial action involving government computers unless the government revives an independent pay research unit.

Another civil service union, the Civil and Public Services Association, which represents clerical grade staff, could escalate action in support of the striking air traffic control assistants at West Drayton air traffic control centre following the use of RAF personnel last week to supply fuel for the generators and air conditioning needed for computer and radar equipment at the centre.

And ICL customer engineers have voted in favour of nationwide action if a meeting with ICL management this week proves unsuccessful (page 3).

The SCPS dispute centres around the independent body known as the Pay Research Unit, which used to compile statistics for use in Civil Service pay negotiations with the government.

It was run down in 1975 and the government has said that before it is restarted certain modifications must be made. These include making the unit more publicly accountable and having staff from outside the Civil Service employed by it.

However, an SCPS spokesman said: "If the unit is not restored within the next two weeks we will have to go ahead and formulate a pay claim and submit it."

Adding to this, Gerry Gillman, general secretary of the union, said: "We would not shirk from taking industrial action. People should not believe that we have no industrial muscle."

"One of the main areas we will be looking at as possible targets are computers," said the SCPS spokesman. "In 1973 we had a dispute with the Post Office and called out the computer programmers in support of the pay claim. It was later calculated that it would have cost the Post Office less to pay our demand in full straight away, and backdate it to the 17th Century."

Areas that may be hit by any industrial action, which could become nationwide, are tax collection, customs and excise, and social security and industrial grant payments.

The strike at West Drayton has been going on for nearly two months (CW, August 25).

The centre is used as a civil and military air traffic control base and, according to the Ministry of Defence, the fuel taken in last week was vital to maintain computer equipment, which includes an IBM 9020D and a Marconi Myriad system.

Fuel stocks had become "unacceptably low" according to the MoD because the normal drivers, who are members of the Transport and General Workers Union, had refused to cross the picket line.

The Civil and Public Servants Association is now looking to railway and road unions to cut fuel supplies completely.

SDL joins Insac

COINCIDING with its first full board meeting last Tuesday, the NEB's Insac software consortium announced that Systems Designers Ltd had become its fourth member company.

SDL has long had a close association with the government, handling in particular several projects for the Ministry of Defence. The NEB has purchased 26% of the company's shares for £182,000 and will provide additional loan capital of £300,000 over five years. SDL managing director Philip Swinstead will join the Insac board.

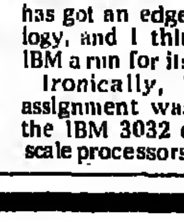
Swinstead was clearly conscious that the move might lead to SDL being labelled a "lame duck" in need of government finance. He stressed that the company is healthy, but has been seeking finance from several sources for expansion.

At the Insac board meeting Alex d'Agapeyeff, chairman of CAP; Peter Adams, managing director of SPL; and John Gow, managing director of Systime, were appointed non-executive directors of Insac together with Swinstead. David Dunbar, the NEB's divisional director for computers and electronics was appointed Insac chairman.

Amdahl top man in UK

AFTER 17 years with IBM in the UK, latterly as the company's product management manager, Peter Williams has moved over to the competition and has been appointed managing director of Amdahl UK, and general manager, Northern European operations.

"I accepted the post because it is a bigger job than what I was doing with IBM and offers more excitement. Money was of course also a factor," Williams told Computer Weekly.



Peter Williams

"It isn't all that easy to leave IBM, but I think that Gene Amdahl has got an edge on the technology, and I think we will give IBM a run for its money."

Ironically, Williams' last assignment was the launch of the IBM 3032 and 3031 large-scale processors.

USER SPECIAL

A series on communications between the DP department and users; an announcement of a workshop on DP/user communications; and the latest User Forum are all in CW this week. See pages 2, 18 and 19.

COMPUTER WEEKLY'S INSIDE NEWS

GILB AND ANTI-GILB
Forthright columnist Tom Gilb this week comes under attack for his anti-mini myths, while Gilb himself provides a few useful tips on database diagnostic programs. Pages 4 and 6

BRUM BEAT
Tim Palmer and Robin Webster report from Birmingham on the first International Business Show, which seems to have successfully superseded the [illegible] Page 16

BRITISH SUCCESS
"The greatest advance in clinical radiology since the discovery of X-rays" is just one of the accolades given to the EMI body scanner. Nancy Pocock explains how the system works and why the computer industry should support a special scanner appeal. Page 20

LOH AND BEHOLD
How Professor Shiu-Chang Loh is using computers to translate Chinese into English. Page 21

CODE OF PRACTICE
The CSA code of practice for recruitment companies is published in full. Page 2[illegible]

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On-Time Systems

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COMPUTERVIEW

Time for the DPM to communicate with users

WHEN the economic chips are down, as they are now, the DP department can no longer use the mystic aura of technology as its reason for existing. Instead, like all service organisation, it has to market, sell and prove its worth to its customers — its users.

Organisations with DP departments are now being asked to deliver the economic goods, to provide an efficient service which enables the organisation to increase its services productivity, profitability, etc at a time when it is not possible to spend lavishly on new equipment or on increasing the work force.

Technologically, the DP department is under attack from minis and micros, a situation which threatens to result in information processing anarchy.

Gone are the clear-cut days where a company's spending on computers was solely in the hands of the DP manager. Office managers are now being sold computers in the guise of word processing systems or office machines.

Independently minded managers, tired of the costs, overheads and delays caused by past computer implementations, may now take it into their heads to get their own micro-based system for a few thousand pounds.

That is the main reason why DP managers have supported Professor Dijkstra's thesis that micros represent a 25-year step backwards.

As the capital expenditure on hardware drops, it is enticing for non-DP managers to get their own system to give them more apparent control over their own information processing than if it was part of the DP department's many-tentacled grasp.

DP people know, however, that hardware costs are the least significant element these days, and a lot of money could be spent in re-experiencing the painful software birth pains of the modern computer industry.

The only way for the DP department to fight off the dual pressures from users and technological developments that distribute computer power outside the DP ghetto, is to get out and explain and sell DP services to users.

The communication skills needed to bridge the gulf between user and DP department are essentially the same as the communications skills needed in any other selling or public relations operation.

Unfortunately such marketing attributes are not always seen as an intrinsic part of the make-up of the good DP manager.

This week Computer Weekly is starting a series by a specialist in the art and science of human communications, Nigel Laurie (page 19). At the end of the series, Laurie will be conducting a workshop at which these techniques can be discussed and developed in more depth (see below).

At the same time, a survey of DP managers will aim to establish the current state of communications between the DP department and users, pinpointing useful techniques and areas of neglect.

The rewards for the DP department as a result of improved communications with users will be invaluable in increasing the perceived value of the DP department.

This will give the DP manager more status and more power when it comes to putting the case for the DP department to be seen as the focal point for any organisation's total information service.

It will enable the DP manager to argue more effectively that pockets of mini/micro centres should not be allowed to develop outside the overall control of the DP specialists.

And it will, at last, bring down the barriers between users and DP people, which will improve the status and career opportunities of DP staff and also help to ensure the effectiveness of DP systems.

Ten years ago...

- COMPUTER WEEKLY OCTOBER 19, 1967.

THE 1906A, "a giant computer with more than twice the power of Atlas," was announced by ICT, the company's first venture into the use of integrated circuits . . . The largest communications network which STC had ever sold, and which included both the first-generation principles of Strad and the 6300 ADX system, was officially opened in London for the Royal Navy . . . A £1 million project which, it was predicted, could give Britain the lead in the computerised process control field was planned jointly by AEI, the Steel Company of Wales and the Ministry of Technology . . . A scanning technique for the production by numerical control of parts that could not be reduced to a mathematical specification was demonstrated by Siemens . . . Japan's Meteorological Agency ordered an Automatic Data Editing and Switching System, ADESS, consisting of two Univac-30 control computers and a Toshiba 5400. Weather information was to be collected and shared on an international service with Washington and Melbourne.

DP/user workshop

IMPROVING the skills of DP management in communicating with user departments is the main objective of a workshop to be held in London on December 1.

Organised jointly by the Data Processing Management Association and Computer Weekly, the workshop will be run by Nigel Laurie, managing director of Communications Audit.

To ensure that the workshop will be of practical benefit to those attending it, Communications Audit has prepared a survey of user communications techniques which will be used as input to the workshop.

The survey will be sent shortly to all DPMA members; other Computer Weekly readers can obtain a copy of the survey form from the DPMA.

Topics to be covered at the workshop will include examinations of particular communications techniques, such as the use of booklets, house journal stories and annual user reports, as well as an overall look at the future role of the DP department and the role of user communications in DP strategy.

During the day there will be an opportunity for smaller working group sessions in addition to presentations to the full workshop.

● A series of articles by Laurie in Computer Weekly (see page 19) will set the scene for the subjects to be tackled.

Places at the workshop will be limited to ensure that each participant obtains maximum benefit from the day. If there is sufficient demand, further workshops will be held.

The workshop will be held at the Holiday Inn, George Street, London W1, near Marble Arch. It costs £46 plus VAT (£40 plus VAT for DPMA members). Application forms can be obtained from IPC Business and Industrial Training, Throwley Way, Sutton, Surrey SM1 4QQ.

Survey forms can be obtained from the DPMA, 27A York Road, Maidenhead, Berkshire SL6 1SQ. Tel: 0628 29679.

Contenders for Info-Line

AN announcement is expected shortly as to which company will operate the Info-Line information service which is sponsored by The British Library, Department of Industry, Chemical Society, IEE and Derwent Publications (CW, June 16). BOC Datasolve, CRC Information Systems and Hoskyns are reported to be among the contenders.

Last week the US-based information service, the Lockheed Dialog system, was demonstrated to librarians in London. It offers access to 17 million abstracts from technical sources around the world and already has over 100 UK users.

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FOCUS

... on the need for more down-to-earth exhibits at Datafair

THAT much heralded Datafair Technology Corridor proved to be remarkably short, the technology exposed being limited to a half dozen ill-assorted participants, some having only a tenuous connection with mainstream computing.

In fact the basis of selection for the Corridor could well have presented a fascinating discussion topic, replacing perhaps some of the more abstract lectures presented during the assembly.

It was not purely the delegates or visitors who were puzzled by the seemingly random representation of future technology. Those taking part seemed equally baffled. It was a widely held belief of those present that the Electronic Music Studios had got their venue (or dates) wrung. Just what relevance an electronic speech synthesiser system has for the DP industry is hard to fathom. Maybe it is felt that the DPM should modulate his voice following the discovery that the whole of the previous day's output has been lost — presumably shredded. Or the disc involved in the head crash has been re-loaded.

Even so, investing in voice control equipment does appear somewhat extravagant. The presenter himself, following an impressive mind-blowing session, seemed at a loss when asked by Focus who would be potential users of such elaborate and expensive gear.

In contrast the Plessey bubble memory device exhibit could well have been of considerable interest. Unfortunately, someone had stuck a pin—in the shape of a power cut — in the collected bubbles and demonstration was limited. Unlike their US competitors, Plessey seem loath to project themselves and their product into the DP market place and research is still proceeding. Meanwhile, such companies as Texas Instruments have no doubt got salesmen floating out, swamping the DP industry with bubbles.

Other exhibitors were hardly in the future technology category. The EMI voice recognition system is hardly new; similarly Quest Automation's Datapad system already has a healthy list of customers.

Not all DP professionals would agree with Dr Chris Evans who, in the recently published paperback "Science Fact", suggests that man is about to create a new companion for himself on his native planet, Raluts. This, Evans surmises, will revolutionise life in the 1980s.

In fact, of course, scientific timetables are just about as reliable as the average programming project forecast. Both are hopelessly optimistic at the time of writing. And both can be guaranteed to make less than anticipated impact on fruition.

Given the choice, most DPMs would plump for an early bred third generation working environment, with its well tabulated problems and hazards. They would voice agreement (modulated or otherwise) that a more practical Datafair would include:

- ● A display of guaranteed software debugging kits;
- ● A line printer which gives a four minute warning before running out of paper and does not emulate the Concorde on take-off;
- ● Tape drives with finger-proof shutter.

However, the Datafair stands did provide one highly significant factor: that the basic requirement of DP life is not advanced technology, sophisticated software or intelligent co-operation between man and machine.

The overwhelming necessity is for prime power. At the show, power cutting was rampant. Signal strength fluctuated in line with the air-conditioning. Typically, IBM had brought its own outside generator. For the rest, it was all too often "corridors of low power."

INTERRUPT...

The prospective purchaser of a key-to-disc system was visiting the manufacturers at Hounslow, West London for a demonstration. Behind the scenes, the engineering and support staff — as often happens at demonstration time — were feverishly trying to get the system on the air. But flashing error lights were constant reminders of their failure. Front office was beginning to run out of ideas to distract the waiting customers when the problem was solved. As it was during the miner's strike, office lighting was off and the demo room's blinds were raised.

This incident occurred during a period of power cuts so the lights were out and the blinds raised. The processor was facing the window, through which the main Heathrow Airport radar could be seen. Every time the radar scanner pulsed every processor flip-flopped and the system crashed. Dropping the blind solved the problem and the demo followed, whether to a successful sale or not we do not know.

Moral: It is sometimes better to leave your customers in the dark.

● Submitted by Harold Mead, of Kilcreggan, Scotland, who wins the weekly £5 Interrupt prize.

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Ledger clerk makes good . . . Ronald Smith, 23, left school at 16 and became a bought ledger clerk. He has just become the thousandth student to come through a course run by Control Data Institute as part of the government's Training Opportunities Scheme and find a job. He is now a trainee programmer at George Wimpey at Hammersmith, West London.

Training project backed by EEC

COMPUTER managers and training officers are getting together in December at a workshop funded by the EEC and aimed at improving the training of computer staff.

The workshop is part of the second phase of a study into training started by the EEC three years ago (CW, October 10, 1974). That phase, funded to the extent of £11,000, showed up a lack of communication between computer managers and their companies' training officers.

This latest phase, with £15,200 worth of backing, will bring the two groups of people together to get an understanding of each other's work.

The workshop will give each pair of training officers and computer managers a model of a company with training problems. They will analyse the company's needs and produce a course for staff.

One of the major aims of the project is to produce a standard, ideal training programme for general release.

The workshop will be held in Munich on December 7-8. Like the first phase of the project, it is being organised by the Institute of Personnel Management and the National Coal Board's subsidiary Computer Power. The working language will be English. The cost is £90, which includes accommodation.

Further details can be had from Malcolm Campbell, Institute of Personnel Management, Central House, Upper Woburn Place, London WC1H 0HX. Tel: 01-387 2844.

Datapoint adds 1500

A REMOTE data entry and validation system has been introduced at the bottom of the Datapoint range of distributed computing systems.

Called the 1500, the new system can have two floppy disc drives with a total of 500,000 characters of storage, 32K bytes of random access memory and a display terminal which includes five programmable function keys.

The 1500 can communicate with IBM mainframes under 3780 protocols, and interfaces for other mainframes are under development.

Software includes Dataform and Databus, high level languages for data entry, validation, editing and for limited data processing. All software is upward compatible.

Datapoint's UK distributor, Ventek, said that with prices ranging from £4,600 to £6,000 the 1500 was one of the most competitive systems of its kind.

Nixdorf plans 50 Mbyte mass storage cassette

A NEW mass storage system for the business computer market is under development by Nixdorf Computers in Paderborn.

Like the IBM 3850, the Nixdorf device will store 50 Megabytes on each cassette, but there the similarity ends (CW, October 24, 1974).

The IBM cassettes are four inch long capsules, whereas Nixdorf is working on cassettes similar to those used for videotape. Nixdorf also plans to offer single 50 Megabyte cassettes as a cheaper alternative to a second disc drive.

The single cassette version is likely to appear next year, and the multiple version will follow once the stacker mechanism for loading the cassettes has been developed. Nixdorf envisages stackers capable of loading anything from 10 to 100 cassettes.

Nixdorf is also working on an extended controller for disc and tape subsystems based on the Zilog Z-80 microprocessor for use with its 8870 line of business computers. It will be possible to initiate loading of a complete 50 Megabyte cassette into the disc either from the CPU or from the extended controller.

A key benefit of the extended controller is that it will enable the user to change the type of disc he uses without altering his application software.

The company is putting a major development effort into the 8870/1 business system, which runs under an operating system developed in Canada and originally used the DCC 110 minicomputer also used in the Nixdorf-Entrex key-to-disc systems. The DCC 118 mini was designed to run Data General Nova 1200 software and was the subject of a lawsuit before Data General acquired DCC.

Nixdorf is now developing a new processor for the 8870/1 which will again use the Data General instruction set but will be architecturally completely different; the company therefore does not expect any lawsuits from Data General.

Memory on the new processor will extend to 128K 18-bit words, and it will be possible for two CPUs to share all main memory and peripherals. At present the 8870/1 supports up to four workstations, but that is to be extended to 18.

Nixdorf is also using a software generator, Chleo, Checklist input-customer oriented output, to customise applications in its Comet business package more cost-effectively.

The customer can either answer the questions which define his requirements via a VDU on the 8870/1, or by responding to a printed questionnaire.

The concept of the applications software generator was explained in some detail by Bill McKeeman at the Newcastle seminar on the teaching of computer science (CW, September 15).

Why Heinz is backing Britain

A rosy future for the UK is predicted by Heinz Nixdorf, founder and head of Nixdorf Computer of Germany. "I am buying long-dated British Government stock (gilt-edged securities), and I believe the UK has one of the brightest futures in Europe," he said.

Speaking at the company's Paderborn headquarters last week, Herr Nixdorf went on to question the extent of the damage done by strikes in the UK.

"How many days a year are lost in Germany through Roman Catholic holidays?" he asked. "They cost us far more in lost working time than strikes cost Britain."

Nixdorf said that had he not been born in Paderborn, he would be investing in the UK right now. Nevertheless, plans to build a plant in Ireland have stalled over building costs. Nixdorf has a big new plant in Paderborn and is not prepared to pay a premium of more than 10 per cent for a similar plant in Ireland. The best quote he has had so far is 60 per cent more than the £150 a square metre he paid in Paderborn.

Two vital meetings for ICL

TWO crucial meetings are due to be held between ICL management and union representatives this week.

One meeting is to discuss a job evaluation scheme for customer engineers. ICL faces the threat of nationwide industrial action if agreement is not reached.

The engineers have voted in favour of possible action in pursuit of a scheme seeking guaranteed movement between grades, with maximum grade salaries ranging from £4,234 for Grade 4 to £4,950 for Grade 1.

The other meeting, which managing director Geoffrey Cross is due to attend, will discuss a total company pay package that includes a self-financing productivity deal that could total over 20%.

According to ICL, technical and administrative problems have caused a delay in implementing this scheme and first bonuses are not expected before the end of November.

ICL also claims that the productivity agreement cannot be finalised until the total pay package has been agreed, whereas union representatives believe that productivity plans are separate from other pay negotiations.

ICL Pascal users expect boost

WITH the prospect of an ICL-supported compiler on the 2900 for the structured language Pascal, interest in the language among ICL users is bound to grow. A group formed earlier this year for exchange of information and software among ICL Pascal users is anxious to harness this interest.

The Pascal Clearing House for ICL Machines is organised by David Joslin, of the University of Sussex. It aims to act as a conventional "user group" for the 1900 and 2900 compilers, meeting to discuss developments, and circulating reports on enhancements and bugs, as well as avoiding duplication of effort in development of Pascal software.

An extension of the group's activity which has just begun is negotiation with the Numerical Algorithms Group, which already produces a large library of scientific routines in Algol 60, Algol 68 and Fortran, with a view to translating the library into Pascal. This effort is being co-ordinated by David Barron of Southampton University.

The 2000 Pascal compiler is being developed for ICL by a consortium of universities, and should emerge by the middle of next year. The 1900 compiler was developed by Queen's University, Belfast.

IBM likely to scoop major client for SNA

A SIGNIFICANT UK client is on the cards for IBM's SNA communications architecture. ICI's Fibres division, in Yorkshire, is in the course of installing an IBM 370/158 and is considering a network of SNA-oriented 3790 terminals. There are, however, at least some competitors still in the running.

While confirming that an evaluation of terminals is in progress, and that the 3790 is one of the competitors, a spokesman for the division declined to name any other contenders. Burroughs and Four Phase Systems (CW, January 20) are, however, high on the list, say reliable sources.

Although ICI divisions throughout the country use a wide variety of computer equipment, IBM accounts for the majority of its mainframes.

A successful SNA system installed at one division could clearly increase the chances of wide adoption by one of the UK's largest companies.

Burroughs, however, already has a foot in the door with a 6700-based distributed system at ICI's Pharmaceuticals division at Alderley Edge, Cheshire, and a 2700 and 3700 at the Plant Protection division, at Haslemere, Surrey.

Intel 8080 at heart of Membrain ATE range

A NEW range of automatic test systems utilising a microcomputer controller has been introduced by Membrain. Based on an Intel 8080, the controller is common to all four members of the MB7700 range.

The controller consists of the microcomputer, which has a 200 microsecond cycle time, display and keyboard, and a floppy disc system. This forms the basis for the MB7730 high volume printed circuit board functional tester, the MB7710 transportable tester for using factory test programs in the field, the MB7750 analogue function and in-circuit inspection tester, and the MB7790 simulation and programming station.

The software, which is based on a transportable operating system, comprises a variety of specialist testing packages. They include the industry standard Atlas and Memtest 7 digital programming language, which is compatible with earlier Membrain test software.

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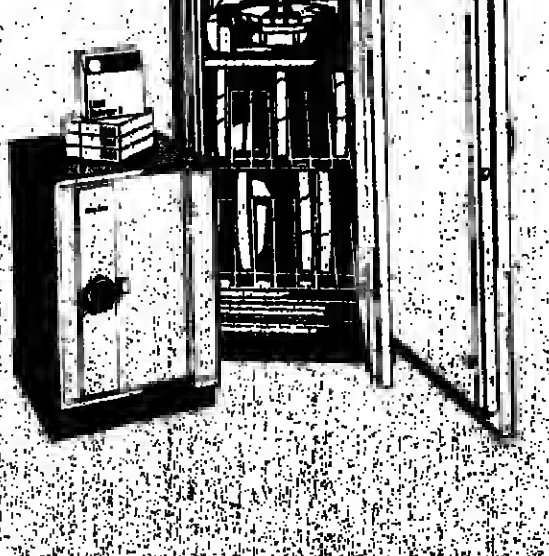

DOWNTIME

by Chad

whistles the tun "MY WAY"
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The star human of the whistling show, grand champion Harvey Pollock, is introduced by Kip Tillitt of Logical Machine Corp.

Rib-tickling...

IN Carson City, Nevada, October 1 will not be quickly forgotten. On that day 82 people from the world's greatest nation blew off at the start of the first International Whistle-Off.

The Whistle-Off, previewed exclusively in Computer Weekly (Downtime, September 29), was organised by Logical Machine Corp as a publicity idea for Adam, the office computer which you program in natural language. The Whistle-Off was the idea of a firm called Gordon Bennett and Associates. Gordon Bennett!

The contestants included a coachload of people who accompanied one Sally Cohn with washboards, spoons and thimbles; Jake Pultrum, who, with the help of his fingers, whistled The Battle Hymn of the Republic; and the Adam computer itself, which did My Way its way.

The overall Grand Champion was Harvey Pollock, a barrister from Winnipeg, whose repertoire was based mainly on the works of Mozart.

The real winner, however, was Logical Machine Corp. For highlights of the Whistle-Off were shown on television across the US, radio stations played Adam's effort and many newspapers covered the event.

Magnetic future

OUR recent Delphic poll on future technology (CW, September 29), has aroused a great deal of interest and Dr Christopher Evans and his helpers are now analysing the hundreds of replies.

A mini-poll, based on our questionnaire, was held last week at Stanmore Junior College, north London, during an evening meeting on mathematics and computers, which included a talk by my editor on Can Computers Save Britain — and Who Cares?

An interesting conclusion of the mini-poll was that a majority of the 20 or so sixth formers and maths teachers questioned believed there would never be an anti-Luddite computer movement.

The results of the Stanmore poll were brought into question, however, when it was discovered that, due to some confusion, one of the questions asked, "When would magnetic media be replaced by solid state devices?" Although neither the interviewers nor interviewees understood the question, 15 people had a shot at it and eight of them said it would happen after 1995!

Some weeks ago, in his Mythodology column, Tom Gilb attacked what he considered to be overstated benefits of database techniques. In his general criticism he referred to the threat of the increasing use of minis for databases — machines which he considers inadequate for such tasks. Now the challenge has been taken up by Jeremy Slater of Norsk Data, the only computer manufacturer in Norway, Gilb's homeland. Slater makes the case for online database systems using minis, and outlines some of the facilities such configurations can provide.

Exploding the anti-mini myth

IT is well known, and has been accepted from Biblical times, that you cannot be a prophet in your own country. It is therefore not surprising to find Tom Gilb slaying dragons of IMS, Codasyl and databases on minis in an environment separated from his homeland (Norway) by the North Sea (CW, September 8).

One of the reasons why he has yet to find a successful database user, be it IMS or a Codasyl type database, is that he has a gift for either not meeting them, or when he meets them of carefully forgetting the conversation afterwards.

At a packed meeting of the Norwegian Computing Society last year I opposed him on several accounts, and I would now like to describe why.

My own experience is limited mainly to that of implementing a Norwegian Codasyl database system on a Norwegian minicomputer. However, I would like to show how that refutes Tom Gilb's arguments.

Database manipulation languages are not obsolescent, as Gilb claims, mainly because they (I am thinking of Codasyl) still represent the cheapest way to do it, and there is nothing to replace them anyway.

The next step is relational databases, when their use can be explained in three (or maybe four) letter words and the hardware has arrived. I don't think it takes long to sell sets and record types à la Bachman to an intelligent person who knows nothing about computers! And that's what he needs to be able to express his problems in acceptable terms.

Database languages do not encourage the use of complex file structures. A given database system will give a choice of possible storage structures and access mechanisms. A database will be a model of some part of an organisation for which one wishes to record and handle data and produce useful information from it.

A successful application of a DBMS occurs when one has arrived at an adequate model which reflects both data and its usage and which can be relatively easily converted to a physical database using the facilities of the chosen DBMS. Total failure and non-cost effective database applications can more often than not be traced to insufficient understanding of the problem; or trying to start too big too soon.

GO TO statements and virtual memory have been much maligned because of their misuse. Anybody can misuse anything including database management systems.

We at Norsk Data have been implementing online databases on minicomputers since January 1975. We now have some 30 installations running from five to six terminals, a 128K byte machine, 10 Megabyte disc up to a multi-machine distributed database system with four machines, 1.5 Megabyte core, 200 Megabytes disc, plus 60 terminals on a data network.

How then can Gilb claim that database systems are too lavish for minis?

If a customer knows what he wants he can be in production with his DBMS online within from one to three months after getting his hardware. If he isn't running a test database inside three to four weeks then something's wrong.

Of course mistakes can be made. We had one case when membership in a manually maintained set was used as a status indicator. There were 50-60 set members per set, and it had been implemented as a single chained set. One consequence of that is that we now vet all database designs, thereby taking upon ourselves the responsibility for any "heavy" databases.

I have spent a year teaching people to use our DBMS online, using one-week courses. Most students can program and they are normally online against a predefined database using a simple query language at the end of the first day. It takes about two days to learn the DML.

If you can get an order entry system using a DBMS up and running with multi-user concurrent access, logging / recovery / privacy / online in four weeks from scratch, how would you justify not using it? If you belong to an organisation which moves with the times, how is changing your database every other month going to go without the reorganisation facility supplied as part of the DBMS you don't use?

I agree with Gilb that minis are a threat, but it is certainly not a threat to the user, it is a threat to the continued use of mainframes for database applications. The quality of software of all types on minis is now not particularly different from that on mainframes.

On minis you can: Run time sharing, batch, remote batch and real time, simultaneously; use Fortran, Cobol, Basic, Simula, BCPL, Coral 66, Algol, PL/1, etc; have a few thousand M-bytes of online disc storage; machine-machine protocols as standard; and online DBMS.

It is in fact nonsense to say that they are "unsuitable due to the lavish overhead costs". Our DBMS, called Sibas, include facilities for Codasyl; multi-user concurrent access; a maximum database size of 3.6 x 10 bytes; complete privacy functions; complete backup/recovery rollback before/after image logging; an average 20-30 DML calls executed per second; and distributed databases standard software.

It is better to have your database on a mini because on-line it is always cheaper; it is physically portable — and it is good fun to go distributed!

Finally, our first customer for a database decided to go that way because they wanted to distribute the availability of information around their concern, and have it online.

In 1975 they jumped in, moving from a Cobol/IBM batch environment, to a mini/Fortran online service with five or six terminals, 128K byte and 10 Megabyte disc.

They now have two databases each on its own mini, coupled via software with 24 terminals. Any or both databases can be accessed simultaneously from any terminal. They have decreased costs (totally), thus increasing production, and they are now buying a third machine.

The author

Jeremy Slater has degrees in physics from both Oxford and London. He has been in the computer business since 1970 and has been involved in the design of systems software for minicomputers, databases, file systems, operating systems and programs for handling video output.

CONFERENCES

AMSTERDAM is the venue for two events organised by Online, taking place on November 14-18. The conference on business telecommunications will feature speakers from user organisations, for example British Steel, du Pont and Ford, as well as the telecomms consultancy and advisory side, eg Arthur D. Little, Pactel and ICSC, and the British Post Office and the Dutch PTT. The professional development seminar will be led by Dr Martin Healey and David Hohditch. Further details from Online, Cleveland Road, Uxbridge UB8 2DO, tel: Uxbridge 39262.

A REPEAT of the IAG seminar Decision Tables Revisited, first held earlier this year, will be given on December 12-13 at the Apollo Hotel, Amsterdam. The purpose of the seminar is to present the most recent developments in the area of decision tables. For further information contact IAG Headquarters, 40 Paulus Potterstraat, 1071 DA, Amsterdam, Netherlands, tel: (020) 78 35 26.

STUDIES of management in action by Sir William Atkins of the W. S. Atkins Group and Brian O'Heron of ICL will be presented at the one-day conference entitled Successful Project Management from Kingston Regional Management Centre which is to take place on November 23 at the Café Royal, London. Further details are available from the Conference Secretary, Kingston Regional Management Centre, Kingston Polytechnic, 40 Coombe Road, New Malden, Surrey KT3 4QF, tel: 01-942 8955, ext 255.

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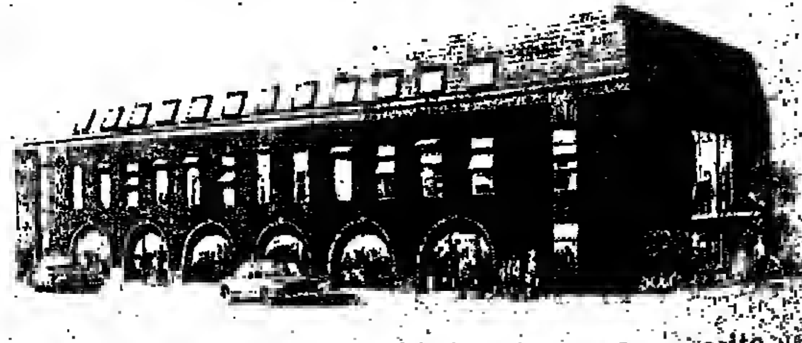

Following in the footsteps of Hedsor . . .

Reay Atkinson

Ian Lloyd, MP

AN imaginative programme ranging from discussions of the social and political impact of computers to computer cartoons has been organised by the British chapter of the ACM for its 1977/78 programme.

Three of the sessions will follow up the themes of the Hedsor Park weekend conference earlier this year, entitled "Can computers save Britain?" (CW, July 14) The conference was organised by Computer Weekly and the ACM, which is the US equivalent of the BCS.

Dr Christopher Evans, psychologist and computer scientist, will start the programme next Tuesday (October 25) and will look at the psychological and social impact of computers.

On January 17 next year Barrie Sherman, research director of the white collar union ASTMS, is to discuss the effects of technological change, particularly on the working environment. And on April 11, a panel discussion of government policy for computer technology will include Conservative MP Ian Lloyd and Reay Atkinson, director of the Central Computing Agency.

The other sessions outside the themes of the Hedsor conference start with Logica chairman Philip Hughes discussing industry changes over the last year on November 29.

On February 28, Colin Emmett of the Royal College of Art will discuss computer cartoons, including film demonstrations, while on May 23 Ruyer Pye of Communications Study and Planning Ltd, will look at mass communications.

All meetings will take place at the Polytechnic of Central London, 115 New Cavendish Street, London, WC1, and start at 7.15 pm. Wine and refreshments will be served from 6.30 pm.

Expanding BIS on the takeover trail

THE BIS group of companies is seeking to expand its activities through the takeover of other companies or by giving financial backing to groups of individuals wishing to start their own operations.

During this year, BIS has approached over 20 companies with a view to a possible takeover but none of these discussions have led to any positive outcome.

If the circumstances are right, BIS would be interested in taking a minority stake in a company during an "engagement" period, after which either the BIS holding could be increased — or the company could decide to sell back its share.

For the financial year ended February 1977, the BIS Group had a turnover of £2.7 million with a pre-tax profit of £350,000. According to chairman of the group, Roger Graham, they are currently on target for a turnover of over £3.6 million.

Graham believes that to maintain this growth rate, the group will need to extend its operation and it is likely to acquire a minority interest soon in a company outside the computer industry, but which uses computers as an integral part of its operations.

Within the computer business, Graham told Computer Weekly that the group has defined a number of specialist areas in which it is interested, including systems houses, service bureau, word processing and point-of-sale distribution applications.

Graham typified the types of operations which he believed could meld into the BIS group as "companies or groups of individuals wishing to maintain autonomy over their own activities but realising the benefits that can be obtained by associating with a group, such as BIS, which has substantial resources."

In the UK, the BIS group has three companies involved primarily in DP — BIS Applied Systems, which specialises in database management techniques and a wide range of training and consultancy activities; BIS Software, which provides custom built software and systems such as the Midas banking and insurance series; and BIS Deltak, which provides self-instruction systems for in-house training.

Roger Graham . . . need to diversify outside the computer industry.

BIS Software was formed when BIS took over software house Kingsley-Smith and Associates two years ago (CW, November 13, 1975).

The group also has operations in Australia, South Africa, America, Sweden, Teheran, Singapore and Hong Kong.

● David Tebba, director of BIS Applied Systems, is now touring Australia, South Africa and Hong Kong, giving courses on database and real time system design. He will also be a speaker at the annual Australian Computer Society Conference later this month.

Users can have a say

Computers can still have a say on the Carter Committee's report on the Post Office, as copies of the survey being carried out by the Data Processing Management Association and Langton Information Systems are still available.

But hurry, as the questionnaires must be returned in the next 10 days. Results will be published in December.

The address of the DPMA at 27a York Road, Maidenhead, Berkshire. Tel: 0628 29979.

ICL gains firsts in Denmark and USSR

TWO firsts have been notched up by ICL. One is an order from the USSR for a 2903 and the second is a move into the Danish market with the 2960 ordered by a manufacturer of cable, wire and nails, Nordiske Kabel-og Traadfabriker.

The 2903 is going to the Academy of Medical Sciences in Moscow, which co-ordinates research projects in the 50 medical research institutes around the country.

The academy will run the IDMS database management system to keep track of the projects and will also collect public health statistics for the World Health Organisation.

The 2903 is the academy's first computer. The £200,000 machine will have 24K of memory, two 60 Megabyte disc drives, a 7502 terminal, two direct data entry stations and two display terminals.

The 2960 in Denmark will replace a 1903A and enable Nordiske Kabel to expand its communications network, which serves a wide variety of users within the company throughout Denmark. The 2960 will serve eight 7502s, 41 terminals and support IDMS.

Norsk Data names City firm as UK distributor

NORWAY'S leading minimaker, Norsk Data, has signed up a UK distributor for its Nord line of high performance scientific and business minicomputers.

The Norwegian machines are to be marketed by Richard Norton and Co, a company based in the City of London which has hitherto specialised in providing bureau services to the Stock Exchange and City Institutions, using a Digital Equipment PDP-11/40 mini.

"We will be concentrating on London and the South East to start with," Richard Norton told Computer Weekly. "We will be selling to the end-user and to systems builders, and the market areas we are aiming at include applications where the machine will be subjected to severe environmental conditions, applications involving networking, and database applications."

The new machine in the Norsk Data product line is the Nord-10/S, which can address up to 256K 16-bit words directly and allows up to four processors to share main memory.

It includes an optional 1K-word cache; is programmable in Fortran V, Basic, Cobol, Coral 66 and RPG II; and runs under the Sintra III virtual storage operating system (CW1, September 8). The database system is Sibas which, like IDMS on the PDP-11, conforms to the Codasyl recommendations.

As well as the Nord-10, the line includes the 64K-word Nord-12 process control minicomputer and the Nord-50 32-bit arithmetic processor, which needs a Nord-10 front end.

Hazeltine terminal

BECAUSE of a printing error, the Hazeltine advertisement announcing the new H150 terminal, published in last week's Computer Weekly, gave the wrong impression of the appearance of the terminal. We apologise for this error. The correct advertisement is on page 11.

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PRIME

GILB'S MYTHOLOGY

Database diagnosis programs

AS a matter of routine system design for about the last seven years, I have made it a practice to specify a "database diagnosis program" in any system which includes a complex central file or database. I do it as naturally as I have put on my car safety belt since 1960.

I know that not everybody shares my interest in seat belts, but I don't push the point since, in the long term, optional seat belts will result in an increased group of reliability-oriented system designers.

I have been surprised, as the years speed past, and the literature on databases increases explosively, to find virtually nothing on the use of database diagnosis programs in this literature. This inevitably results in most database systems being planned without such a facility. In the long term a set of analysis programs will be developed to solve some obvious operational problems such as mysterious breakdowns in the database. But unfortunately these will often be created for one-time use and discarded shortly thereafter.

A database diagnosis program should, in fact, be a focal point of continued development of our ability automatically to analyse one of our most critical resources, the centralised database. It should probably be developed over a period of years as experience dictates. This means that it must allow the user a wide variety of parameter options as to what shall be analysed and how deeply it shall be analysed. Data Base Diagnosis (DBD) programs can quickly become very machine-resource demanding, if not limited in some way.

A DBD program can be far more effective if it is considered early in the design of the project. One reason for this is that the fundamental redundancy within records and fields which is a prerequisite for detection of certain classes of errors, can be designed into the records and fields from the beginning. Another reason is that the benefits of DBD can be enjoyed throughout the entire project development cycle.

It is an anachronism to think that the application programs provide the necessary tests on records and input data, to guarantee the quality of the database. A true database implies many independent programs which only see part of the data picture *BUT WHICH ARE CAPABLE OF DESTROYING ALL OF IT OR ANY ONE PART OF IT.*

Only a DBD program, like the Data Base Administrator concept, can keep quality control over it all. A database diagnosis program can include every conceivable validity test, applied elsewhere to all fields and records. There is no reason to be afraid of repeating checks (use the same subroutine). It gives protection against failure of one set of checks, and has the added advantage that the DBD program checks can be

A DBD program is an excellent automatic program testing aid during initial program development. It tests that all the programs are co-ordinated to the common agreements on records and data elements. It should be a required part of the program development cycle.

Auditors should insist on and require their own private DBD program, as well as the possession and use of one for the programmers. DBD program amounts to automatic auditing and is the only practical way of thoroughly checking a large database.

A complete DBD program which tests all indexes, chains, records, fields, inter-field relationships, inter-record relationships and even relationships between the database and other existing files, is really, if you think about it, an automatically readable description of the database. Instead of all the incredible energy which I see presently being devoted to making and maintaining humanly readable database documentation, we code) documentation, we should redirect it to putting the same specifications in programmed form. The obvious result is the saving of human effort to read record printouts and to read DB documentation with a view to assuring the correctness of one or both.

One bank which listened to this advice, and applied it to an eight year old "no problems" database in an online system, got a list of 300,000 errors in about a million accounts. The money amounts were all right but the statistical classifications of customers, from which marketing and top management got their reports, was very wrong. Result?

Several months overtime at the branches to clean it up and a 20 minute DBD program run each morning to keep it clean – by top management order. For more information see my book "Data Engineering (Student Literature)".

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SOFTWARE FILE

EDITED BY STEPHEN BELL

Index generation package in UK

THE role of word processing software in the office of the future has been increasingly recognised, but a kindred subject — index generation — is seldom approached by the developers of commercial word processing equipment. The Austrian developer of an index generation package is seeking to fill this gap in the UK market, by negotiating an agency in this country.

Index generation for character-string data is usually applied to academic areas like literary and linguistic analysis. Ivo Steinacker, the developer of the present package, intends that it should be applied to more "down-to-earth" areas like office correspondence.

"If a businessman knows that he sent a letter to so-and-so about roller bearings, but can't remember the date, he queries the index under the name of the company and "roller bearings," and it will pull out all letters referring to both."

The index is generated in batch mode from "any machine-readable text," such as a tape of correspondence built up from day to day by a word processing system. Obviously, in such a case, periodic re-runs will be needed, to generate the index for the updated tape.

The index generation software will search for phrases as well as single words in the text. To determine initially the correct depth of indexing, a user would normally wish to run the package several times with different parameter values, said Steinacker.

The software will run on the IBM System 32, or any other machine with an RPG compiler, he said. He is also willing to rewrite the package in another language if there is a demand for it.

There are already two prestigious users of the system — the German Standards Institute and the International Telecommunications Union, in Geneva. A test run has also been made by the European Space Agency.

Revised US version for Hoskyns system

A RANGE of manufacturing software, originally designed in the UK by Hoskyns, has emerged from the US in a radically new version, aimed at accommodating the growing use of database. Further versions, directed at the expanding minicomputer market, will be Hoskyns' responsibility.

The Hoskyns suite was originally known as Standard Systems, but, for US consumption, was renamed Modular Applications System. In the US, it is handled by Martin Marietta Data Systems, of Baltimore, which subsequently took control of Hoskyns (CW, April 13, 1975).

MAS II and related new versions have been placed under the general heading of MAS-80. The major innovation with MAS II is that the modules, instead of using several conventional files, are centred around a single database.

MMDS has developed modules to manage the leading database management systems and present the user with a consistent interface. MAS II is accessed in transaction mode, and includes its own small TP monitor, while MAS I worked in batch.

The policy is to direct MAS development effort to the countries where appropriate expertise exists, explained Neville Cerfontyne, who is in charge of developments outside the US.

Cerfontyne said that the first approaches would obviously be to the market leaders such as Digital Equipment, Data General and possibly the IBM Series I.

The first mini implementations should emerge by March 1978; and future plans include implementations for mini-mainframe distributed systems, as well as stand-alone minis.

The database-oriented MAS II is already available in the US and should begin to be marketed in the UK at the end of this year.

MAS is built of six suites, handling production control, inventory management, order processing, cost control, business planning and financial management.

IAM released in US

A RIVAL for IBM's Vsam and Isam disc-file access methods has been generally released in the US and Canada, and is likely to make its appearance in the UK soon. The product, Innovation Access Method, IAM, comes from Innovation Data Processing, of New Jersey.

IAM employs a straightforward indexing system with single reads and writes, which is claimed to avoid time-consuming following of logical chains and a good many unnecessary calls to systems software routines.

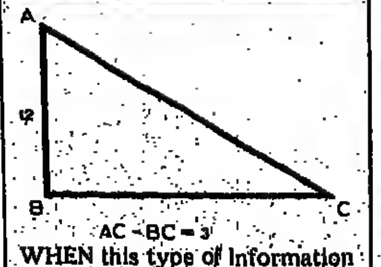
The product already has a number of users in the US, who have reported time savings of over 50% in the running of some programs. Until now, the product has been on "limited distribution".

Westinghouse, agent for many Innovation products, confirms that it is examining IAM with a view to UK marketing, but no final decision has been made.

Experienced users

A MISPLACING of one or two letters can often create entirely the opposite impression to that intended. It is doubtful that any readers of the item on the Disspla users' conference (CW, October 6) seriously thought that local users would be talking about "the inexperience with the system." The intended phrase was, of course, "their experience."

Puzzler



AC – BC = 3

WHEN this type of information is available about any right-angled triangle, there is an ancient formula which gives Length of Hypotenuse in only a few seconds. Can you work out what it is before turning to page 47?

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Filing fiche with Data Boss

A NOVEL application for a database management system has been found by Florida Computer, of Miami. The company has successfully marketed its database management system Data Boss (CW, September 30, 1976), to installations in the US with very large microfiche libraries. UK agent Turnkey Software, of Chalfont, Bucks, is now approaching the same market in Europe.

Users with large microfiche libraries have much the same requirements as those with large computerised databases, notably a need to access the same microfiche by several different keys. The indexed Data Boss system is well-suited to this kind of retrieval.

The simplest approach is to retrieve from the database a reference number which will tell the user where to look for the appropriate fiche or film on a separate physical storage medium.

The terminal can, however, be linked direct to some kinds of microfiche reader, so that retrieval is completely automatic. Data Boss runs on Digital Equipment PDP-11s, under the RSTS-E operating system.

US users of the Data Boss microfiche system include the Hill Air Force Base, Utah. The file managed by the system there will eventually have a size of 2,500,000 records.

UK price for the basic system is £8,000. This supports a database of up to 32 Mbytes. There are further charges for more capacity and multi-level indexing, but the terminal-reader interface is included free.

Interdata enhances OS/32 MT system

WITH an enhanced version of the OS/32 MT operating system, Interdata has introduced dynamic memory management techniques on its 32-bit minicomputers. At the same time, the company has released an operating system adjunct approaching the growing on-line programmer market.

The dynamic version of OS/32 MT2 supports up to 255 concurrent user tasks. The previous version of the operating system had the same theoretical limit, said UK director Gordon Ambidge, but in order to exploit it practically the tasks had to be very small. With dynamic memory management, 255 concurrent tasks became a practical reality, he claimed.

Dynamic memory management examines the actual memory requirements of tasks at regular intervals and adjusts the size of the partitions appropriately, rather than setting up fixed partition sizes in advance.

Such "heuristic" approaches to producing increased throughput have been employed by other mini manufacturers, such as Data General with its Advanced Operating System (CW, November 25, 1976). AOS manages the problem by adjusting priorities rather than memory partitions.

Online programmers are accommodated through the separate Multi-terminal Monitor. MTM supports up to 18 concurrent terminal users and 16 background batch tasks.

Software to maintain private user file directories is included.

MTM, which is the first interactive multi-user capability on Interdata equipment, ensures that programs and files for testing are kept rigidly separate from production programs.

Dynamic OS/32 MT will be officially released in the UK within the next two weeks. Implementation of a similar operating system on Interdata's 16-bit equipment is being considered, but no firm plans have been made yet.

The staff at Interdata's UK software development centre played no part in the development of the latest operating system, but there are hints that the UK centre is working on another large project, as yet undisclosed.

● In its 16-bit line, Interdata has released the 16E processor, capable of addressing up to 256 Kbytes of memory. At the same time, an enhanced release of the OS/16 MT2 operating system has been made, with event driving of tasks and intertask communication. A new Fortran IV compiler is also available.

Scheduled warnings from the Stars

THE range of software products designed by Value Computing, of Philadelphia, to assist the operation of a DP installation, has been extended with another scheduling aid. Like Value's earlier products, it will be marketed in the UK by RTZ Value, a division of RTZ Computer Services (CW, March 31).

The latest product, Stars (Status Revision System), allows the actual progress of tasks to be monitored against the schedule previously generated by Value's Scheduler. Monitoring of tasks in the processor itself is automatic, using data from IBM's System Monitoring Facility. Outside the machine, progress of tasks such as data preparation are notified manually, through terminals.

Stars will warn the user when actual performance is falling behind schedule, so that the schedule can be reorganised, if desired. If a job goes wrong, the user can be informed of any other jobs which depend on it and, in consequence, cannot be processed.

A number of large users in the UK are already interested in the package, said an RTZ spokesman. A UK price has not yet been established.

Hoskyns ties up another FM deal

ANOTHER facilities management contract has been gained by Hoskyns. The company has taken over the ICL 2903 and seven data processing staff at Customagic, of Manchester, maker of furniture coverings.

In a few months the 2903 will be moved from Customagic's site to Hoskyns Manchester Systems Centre. This will enable Customagic to continue using the machine, while saving office space. The company also expects to make a 30 per cent saving on its DP budget. The deal is valued at about £100,000.

PROGRAMMER NOTES

Documentation—need to be all things to all men

DOCUMENTATION is one of the most widely criticised aspects of programs — both the documentation intended for the guidance of a non-computer-oriented end-user, and that which will only meet the eyes of fellow programmers.

In its widest sense, documentation includes everything from end-user and operator instructions to the flowcharts and the comment lines in the coding. A critical, but seldom asked question is whether the programmer should be expected to write material aimed at these various audiences equally competently.

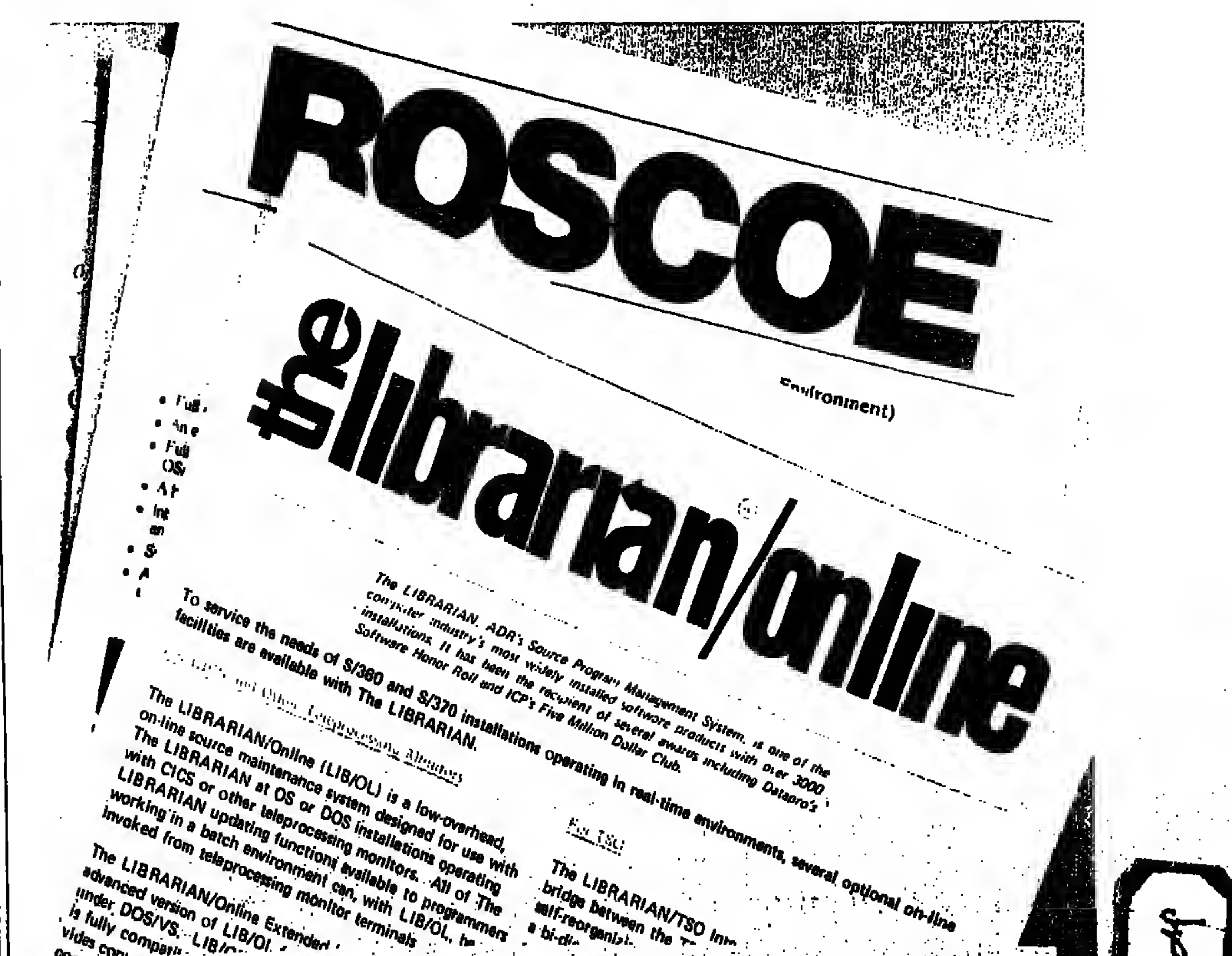
Installations, conscious of the criticism of documentation, tend to impose increasingly rigid standards. To the programmer this often means reams of narrative and diagrammatic documentation. Many programmers find this boring, and of little relevance to the job for which they were trained. The inescapable result is more bad documentation.

How do the readers of this column handle the problem of documentation for all these different purposes? Are you called upon to be a technical writer as well as a programmer? Do you consider yourself adequate to the task, or do you think DP departments could benefit from employing a specialist technical writer?

Programmers are in a good position to judge maintenance documentation, since they are both its producers and its consumers. Is too much or too little documentation required by "installation standards"? What kind of documentation do you find most helpful, and what do you think is unnecessary?

Documentation is also the interface between user definitions of the problem and the formulation of the program to handle it. As such, it is the weak link in the program development process. Can anything be done to strengthen it — for example, a formalised "design language"? If so, of what kind?

What form of documentation do you like to receive from the definer of the problem, whether user or systems analyst?



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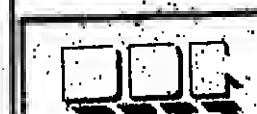

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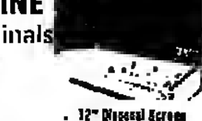

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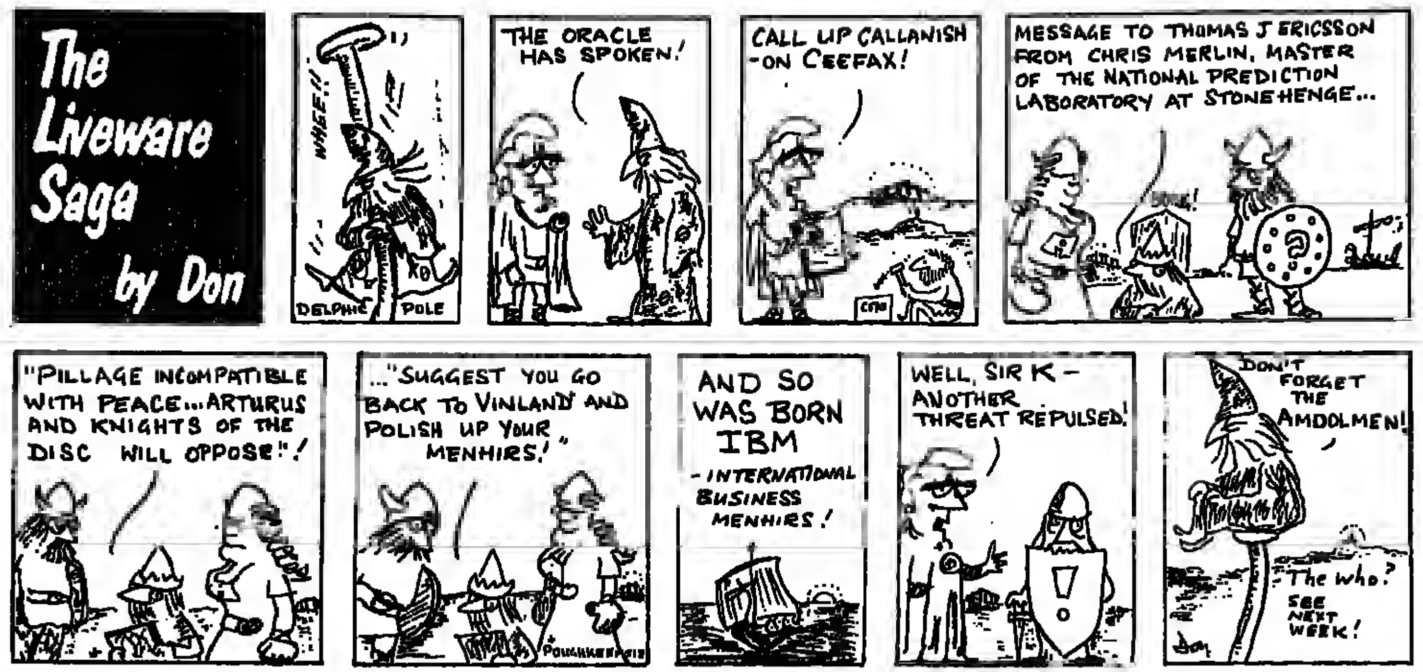
The Liveware Saga by Don
WHEE!!
DELPHIC POLE
THE ORACLE HAS SPOKEN!
CALL UP CALLANISH - ON CEEFAX!
MESSAGE TO THOMAS J ERICSSON FROM CHRIS MERLIN, MASTER OF THE NATIONAL PREDICTION LABORATORY AT STONEHENGE...
"PILLAGE INCOMPATIBLE WITH PEACE...ARTURUS AND KNIGHTS OF THE DISC WILL OPPOSE"!
..."SUGGEST YOU GO BACK TO VINLAND AND POLISH UP YOUR MENHIRS!"
POUGHKEEPSIE
AND SO WAS BORN IBM - INTERNATIONAL BUSINESS MENHIRS!
WELL, SIR K - ANOTHER THREAT REPULSED!
DON'T FORGET THE AMDOLMEN!
The who? SEE NEXT WEEK!

PEOPLE

End of Summer

THE Summer Computer League season ended last week with the champion, Jadpu, winning its last game, thus getting 16 points out of 16. SIA lost its last game and so goes down with Computing. Defeat for TSL in Division Two in the last game, and wins by Lambeth and Southgate sent TSL into Division Three with Laur Punter.

A beery evening on the Thames gave the champions a chance to celebrate, which Division Two winners Datascene (left) certainly did. Our picture on the right shows the league organiser Danny Boreham (left) and the secretary Val Ellis, with the special trophies they were awarded for all their voluntary hard work.

Results and League Tables

Division I
FNS 5, Lloyds 0
FNS 5, SIA 0
Jodpu 5, Lloyds 0

	P	W	D	L	F	A	Pts
Jadpu	8	8	0	0	55	11	16
Gryphon	8	6	0	2	44	8	12
L Trans	8	5	1	2	20	14	11
FNS	8	5	0	3	28	10	10
Lloyds	8	4	1	3	10	10	9
Comshare	8	3	0	5	17	30	6
Southwark	8	1	1	6	10	27	3
SIA	8	1	1	6	11	32	3
Computing	8	1	0	7	7	60	2

Division II
Lambeth 5, Extel 0
Southgate 5, TSL 0

	P	W	D	L	F	A	Pts
Datascene	8	8	0	0	46	4	16
Xerox	8	5	2	1	31	17	12
Lambeth	8	4	0	4	28	23	8
Readers	8	4	0	4	22	20	8
Southgate	8	4	0	4	26	24	8
Comp Wkly	8	3	1	4	18	21	7
Extel	8	3	1	4	18	22	7
TSL	8	3	0	5	21	36	6
Laur Punter	8	0	0	8	0	40	0

Division III

	P	W	D	L	F	A	Pts
Alvega	8	6	2	0	62	13	14
ITT	8	7	0	1	36	11	14
Datasolve	8	5	0	3	33	16	10
IAL	8	4	1	3	27	17	8
Autic	8	4	1	3	26	23	8
C'tral Data	8	3	1	4	24	30	7
D Ital	8	2	1	5	18	28	5
IBS	8	2	0	6	13	43	4
FCS	8	0	0	8	7	61	0

Alan Starkey has become non-executive chairman of Jackson Associates of Colchester. He is also chairman and managing director of Framptons Nurseries Ltd.

The board of Jackson's has also been joined by **Michael Burton**, director of C. E. Heath (Insurance Broking) and **Chris Rengert**, senior partner of Slater, Chapman and Cooke and formerly auditor of Jackson's. Both will be non-executive directors.

Edwards

Francis

Derek Edwards and **Tudor Francis** of CMG Computer Management Group, recently appointed directors of the company, will retain their responsibilities as customer service managers.

Sean Dixon-Child, director of NCR Ltd's financial and government division, has been appointed to the main board of directors.

Frank Zapl, lately of Spicer and Pegler where he was a consultant, has joined Allied Business Systems as a consultant liaison executive.

Silk Finish Ltd of Borehamwood, Herts, has made the following appointments: **Frank Airey**, formerly sales manager of the company's Southern division is now director of sales and marketing; **Frank Smith**, previously a representative becomes sales manager, Southern division; **Jim Kidby**, another representative, is appointed sales supervisor; and **David Ansell**, previously supplies manager with Imperial Typewriter Company of Leicester, has been appointed as sales administrator Northern division.

Valere de Smet has joined Decision Data as vice-president, international operations. Previously he held marketing management positions with Singer and Varian. De Smet replaces **Georg Herzfeld**, who has resigned as chief executive officer of the European operation to pursue personal interests.

Michael Meredith, former area sales manager with Computel, has joined CTL as a senior consultant.

Graham Page, principal computer assistant in the data processing department of London Transport, has now been appointed as training manager of its mechanical engineering department.

Another appointment at London Transport is that of **Paul Larkin** as principal computer assistant (development). He has been promoted from a senior analyst.

Louis Navin, vice-president and treasurer of Honeywell Inc in Minneapolis, has also taken on the job of chief financial officer. Sigurd Uelnnd, formerly assistant secretary, has become secretary.

Christopher Hinde, formerly a research assistant at Bristol University, has become a lecturer in Loughborough University's Department of Computer Studies.

Hervey Jacobs has become a recruitment consultant with Brytek's computing personnel division.

Ivar Rachkind, a senior systems analyst with GEC, has been made database administrator with GEC-Elliott Control Valves.

Nice

Dixon-Child

Stanley Nice, until recently vice-president, programmable calculator/systems marketing with Monroe, has been appointed vice-president, international operations.

CAMA chief appointed

RECENTLY appointed deputy director of CAMA, the Control and Automation Manufacturers' Association, is John Christopher, who has been assistant director of the Association since 1975.

He thereby relieves **Robert Blagbrough**, who remains chief executive of CAMA, of the Association's day-to-day running. Blagbrough has become chief executive of GAMBICA, the recently formed Group of Associations of Manufacturers of British Instrumentation, Control and Automation.

Elliot Wassarman has joined Qume in California as vice-president of marketing. For the past two years he has been director of international operations with the Monroe division of Litton Business Systems in New Jersey.

Peter Corke, until recently deputy MD of Quotel, has been appointed managing director of Scan Ltd which owns Quotel, and also becomes a director of Scan's parent, the CRC Group.

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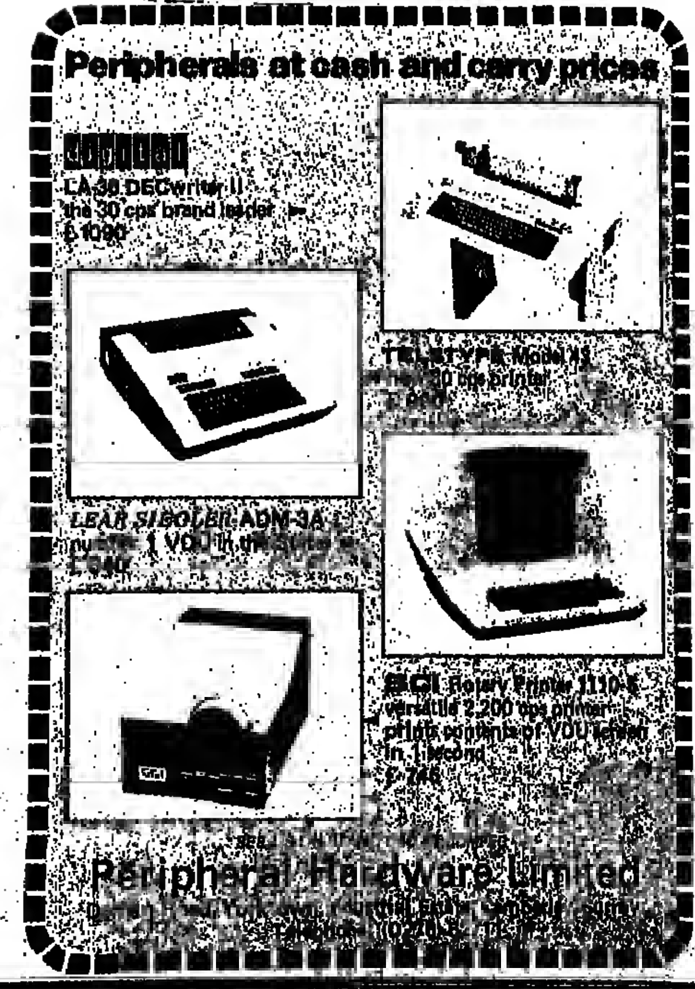

Peripherals at cash and carry prices

[illegible] LA36 DECwriter II the 30 cps brand leader — £1090

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SCI Rotary Printer 1110-S versatile 2,200 cps printer prints contents of VDU screen in 1 second £745

Peripheral Hardware Limited
[illegible]

DIARY

OCTOBER 24
Introduction to microprocessors. Dr B. Spratt, BCS, Merseyside branch. Liverpool University Computer Lab, Brownlow Hill, Liverpool. 18.00.
Pascal and Algol 68. W. D. Shepherd, BCS, Glasgow branch. Daniel Brown's Restaurant, Glasgow. 19.00.

OCTOBER 25
Innovation and development. J. Street and B. Shaft, BCS, Nottingham branch. Tinsle lecture theatre, Nottingham University. 19.00.

OCTOBER 25-26
Computerisation — an objective outlook, seminar. David Firnberg and A. R. K. Hardcastle. OPMA. Marine Engineers Conference Centre, London EC3. Details: Betty Smith, 0628 29976.
Meeting. RTL/2 User Group. Excelsior Hotel, London (Heathrow). Details: SPL International, 01-636 7833.

OCTOBER 25-28
Radar 77 — conference. IEE, IEEE, London.

OCTOBER 26
Legislation and operations. BCS Operations Group. Polytechnic of Central London, London W1. 18.30.
STS (Statistical Tabulation System). BCS, Study Group for Computers in Survey Analysis. Polytechnic of North London, London N7. 17.30.
Our job, computer performance measurement and timing. R. Hanson, D. J. Holt. BCS, S. Wales branch. Royal Hotel, Cardiff. 19.00.
Word processing. K. Baxter, C. Holman. BCS, Teesside branch. Teesside Polytechnic, Middlesbrough. 1900.
Distributed intelligence through the use of intelligent terminal systems. Raytheon Cossor Data Systems. DPMA Essex branch. Raytheon Cossor Data Systems, The Pinnacles, Harlow, Essex. 20.00.

OCTOBER 27
Computer graphics and animation. Prof F. R. A. Hopgood. BCS, N. Wilts branch. Royal Military College of Science, Shrivenham. [illegible]

OCTOBER 27-28
Meeting. IBM Computer Users' Association Operations Group. Centre Hotel, Liverpool.

OCTOBER 31
Transferable systems. BCS Medical (London) Group. ICL, Euston Road, London NW1. 17.30.
Word processing conference and exhibition. Institute of Administrative Management, Scottish branch. City Hall, Glasgow. 9.00.

NOVEMBER 1
Measurement of computer performance. Prof P. A. Samet. BCS, NW London branch. Railway Hotel, Greenford, Middx. 20.00.

NOVEMBER 2
Management Education Seminars — Project management in a structured environment. Data Processing Management Association. Montcalm Hotel, London W1. 14.00.
Is there a future for the DP professional? John Goldsmith. [illegible] South Essex branch. [illegible]
Bankers automated clearing services. G. D. Robson, A. Peralde. BCS, Hampshire branch. Office of Population Censuses and Surveys, Titchfield. 19.00.
Future storage devices. [illegible] BCS Belfast branch. Windsor Hotel, Belfast. 19.30.

NOVEMBER 2-DECEMBER 11
Systemotechnika 77, third international specialised trade fair. Glavne International. Moscow.

NOVEMBER 3
Cybernetics and tax law. Stavros Foundos. BCS Law Group. Financial Times Cinema, London EC4. 18.00.
Hardware survey: comparison of available equipment. BCS Microprocessor Group. Polytechnic of Central London, London W1. 14.00.
Computers in cartography. Dr Thorpe. BCS, Oxford branch. County Council Staff Restaurant, Oxford. 19.45.

NOVEMBER 8-11
Compsac 77, software and applications conference. IEEE Computer Society. Chicago, Illinois.

Coming of the micro systems revolution

THERE is little doubt that microcomputer systems are about to make major inroads into the OEM minicomputer marketplace, according to a report issued by the First Boston Corporation, a New York company of Investment Bankers. Price erosion in micro components, and the potential outcome of forthcoming litigation between mini and micro manufacturers, are the key elements in this trend, according to the report, and the only major stumbling block will probably be a lack of programmes to meet the demand of new applications.

Although the current crop of microprocessors have failed to take away market share from the minis, due mainly to the fact that they are predominantly slow in operation and only 8-bit, the report points to a turning point early next year. At that time, both Intel and Zilog are scheduled to join the ranks of 16-bit device manufacturers, and the report's author Ming Y Li, talks of the Zilog management's prediction that its device will have the equivalent computing power of a PDP 11/45 or PDP 11/70.

With a potential CPU cost of $5 per chip in a few years time, there should soon be considerable migration towards the micro and away from the mini.

To approach the market correctly, however, it will be necessary for the semiconductor companies to enter the field of heavy software support in applications programming, and to establish chains of service centres. Both of these are very expensive exercises, and have been a thorny problem for the companies before, when they have entered the calculator and digital watch markets. Nevertheless, the report predicts a considerable swing towards this camp.

Some 50,000 microcomputers and systems will be sold this year, it estimates, and semiconductor price erosion indicates a potential for a 100% annual increase in sales for a PDP 11/45 or 11/70 equivalent microcomputer system once current micro price levels are reached.

The report highlights two separate aspects to the question of software for the new microcomputer systems. First, there is virtually no compatibility between micro software and the wide range of applications programs available for minicomputers. To overcome this, programmers with new skills will be required.

Secondly, the potential outcome of litigation in the future could well open up that wealth of software, and greatly increase the potential market penetration. Again the major problem will be in finding enough programmers to go round the new applications.

It is the outcome of the pending litigation, and primarily the case drawn up between Data General and Fairchild semiconductor, that holds the fundamental key to the immediate future of the microcomputer. In essence, Data General is sueing Fairchild for inappropriate use of trade secrets in the design, manufacture and marketing of its soon to be launched 9440 microprocessor.

The device emulates the operation of the Nova minicomputer, and although it has different architecture, will run Nova software. Data General claims that every customer signs a software licence agreement, and that anyone using Nova software on another machine is in violation of that agreement.

If Data General wins (the case is unlikely to come to court for several years) the move away from the mini will be slower, and will require new software to be learned. If it loses, then existing software will inevitably become available for micros.

The report speculates that Data General is perhaps hedging its bets, following the recent announcement of its entry into microprocessor fabrication.

Intel adds floating point arithmetic library free

ADDITIONS to its software capability and its range of in-circuit emulators have been made by Intel. The additions cover a new floating point arithmetic library, FPAL, and emulators for the MCS-85 and MCS-48 micro systems.

The FPAL, which will be supplied free to all registered Intellec diskette operating system owners, is intended to reside on a disc as a library routine to be linked into applications software as it is written. It consists of object subroutines that implement the Intel floating point standard for both assembler and high level language programmers.

It provides a 32-bit format add, subtract, multiply and divide, as well as floating point or integer conversion routines, floating point comparison routines and negation, and absolute value and zero routines, all of which save and restore 8080 registers, and are compatible with PL/M linkage conventions and the new RMX/80 executive.

The two new emulators offer the normal facilities of testing prototype system hardware and software simultaneously. With the MCS-85 emulator, the ICE-85, the module is connected to the prototype via 40-pin adapter plug, leaving the 8085 CPU chip in situ, and operational. For the MCS-48, the ICE-48 connects via the CPU socket in the prototype, replacing the CPU chip, which can be a 8048, 8748 or 8035 device.

Successor to System 80

A SUCCESSOR to the System 80 microcomputer system has been introduced by Trivector Systems incorporating up to three Zilog Z-80 microprocessors, with access to a potential read/write memory of 192K bytes.

Known as the Triton 3, the system can be configured with one, two or three processors, depending on requirements. With three processors, the system can be configured as a master and two slaves, with the master processor having access to the total addressable memory capability.

Interface boards are available for a wide range of peripheral devices, such as displays, printers, teletypes, floppy and hard discs.

The normal software for the system is a multiterminal Basic

Addition to Datasure

AN addition to the range of Datasure units from the Laboratory Products Group of Instem is a microprocessor-controlled cassette-tape module designed to comply fully with ECMA 34 standards.

Standard features of the type 1700 module include read-after-write electronics, fast rewind, positive file protection safeguards, BOT-EOT sensors, and in-line "transparent" data collection with remote control.

It has been designed primarily as an in-line listener for the Datasure laboratory data-acquisition and processing system, recording information while simultaneously passing it to another receiving unit. The transparent operation is useful in situations requiring local copies of data.

How PAL differs from IDC Europa

THE table below, sent to us by Pedder Associates, underlines the caution with which all market share figures have to be approached.

It is clear from the table, particularly in the case of IBM and ICL, that the two research organisations, IDC Europa and Pedder, have come up with wildly divergent figures, yet it would be wrong to assume that either set was inaccurate.

The reason for the discrepancies becomes clear when one learns that while calculating the value of installed base, IDC heavily marks down the value of old equipment, so that machines like ICL's System 4 or Elliott 803 are regarded as having little residual value.

Pedder on the other hand uses the value of any discontinued system when last marketed, which means that ICL's large installed base of obsolete machines enormously increases the company's market share.

IDC has consistently emphasised that its approach to valuation heavily deflates ICL's share, and adds that it expects the ICL share to increase once the large 2900s are installed in substantial numbers.

Neither method of valuation can be said to be right or wrong: IDC's is particularly sensitive to recent trends and tends to exaggerate the success of a company which has installed a large number of large systems over a short period; Pedder's gives a stronger correlation between the value of a base and the number of customers a company has.

% SHARE BY VALUE OF UK-INSTALLED COMPUTER SYSTEMS AT END 1976.

Supplier	Source				
	IDC Europa	PAL Annual Census			
		All systems	Mainframes	Mainframes £100K	Mainframes £500K
Burroughs	6.1	9.0	6.7	7.1	5.8
Honeywell	8.5	6.6	6.2	8.0	6.5
IBM	47.2	25.5	37.1	37.4	42.8
ICL	26.5	26.2	37.7	37.8	34.1
Univac	6.0	3.5	5.2	5.2	6.0
Others	5.7	27.0	5.1	4.5	4.8

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Keyboard: Teletypewriter key format for alphanumerics plus numeric pad
Data Transmission Rates: Asynchronous at the following rates: 110; 200; 300; 600; 1,200; 2,400; 4,800; 9,600.
Data Interface: C.C.I.T.T. and 20 ma. current loop. Also, auxiliary RS-232 output for serial read only device.
Parity: Switch-selectable odd, even, one or 0. Received parity errors displayed on the screen with a special symbol.
Video: High intensity and low intensity white characters on black background; or black characters on high intensity and low intensity white background — switch-selectable; non glare display.
Remote Commands: Insert/Delete Line; Clear Screen; Clear to End of Line; Clear to End of Screen; Clear High Intensity Data Only; Home Cursor; Address Cursor; Read Cursor Address; Set High Intensity; Set Low Intensity; Cursor Up/Down/Left/Right; Keyboard Lock and Unlock; Horizontal Tabs; Ring Bell.
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LETTERS

University shows how micros can help industry

I AM unable to let Focus (CW, September 29) get away with it! His comment "...on teaching the academics" cover such a large and diffuse body of institutions and departments that a general reply is impossible and therefore I confine myself to a reply that is specific to this department.

Teaching microprocessors is not a simple affair, nor is it cheap. For a start the microprocessor is only one example of a digital system, although in that context it is revolutionary.

There is also a dilemma – to teach and support one device thoroughly, or to give a broader view of less depth. For financial reasons we've taken the former course and have specialised on just one device, the TMS 9000.

It is hard to measure how effective teaching is – the least we can say is that few students are put off by the ten hours of lectures. Moreover a one-week course we have run four times on the TMS 9900 has been consistently well attended. This has helped us augment our income through some difficult times.

Nor do we indulge in esoteric activities; we've resisted the temptation of microprogramming and multiprocessors. Instead we've concentrated on more useful things such as an intelligent interface to make an incremental plotter behave like a Tektronix display and the software interface between the portable SDL Coral 66 compiler and a Texas Instruments operating system.

We feel we've got things about right so far, though we are well aware of the need for us to keep up to date in order to offer industry a decent return in exchange of their taxes.

Incidentally, where is industry?

We have considerable resources but all too often industry prefers internal empire building. Any company (with or without liquidity problems) who wishes to use our resources for microprocessor support should consider getting in touch.

BILL DAVY
Research Assistant
University of Aston,
Coleshill Street,
Birmingham, B4.

Why we're not so insular . . .

P. G. BARKER (CW Letters, September 22) is certainly very wide of the mark when he described NDPCAL as an "orthodox and somewhat insular" organisation.

One of the particular features of NDPCAL is that from the first it broke away from the orthodox CAI "programmed instruction and drill" approach as practised ad nauseam in the US at that time, and still much in evidence there to this day.

CAI (Computer-aided instruction) is the orthodoxy, at least in the US, and it is to the great credit of Richard Hooper and his programme committee that the NDPCAL had the vision to be unorthodox by aiming at the wider context of CAL (computer-assisted learning), of which CAI is a subset.

From this low-profile, learner-oriented approach, often using small-scale simulations, came the possibility of using small and relatively easily affordable minicomputers for much of the work, often under the direct control of the teachers concerned rather than accessed via the bureaucracy of a large computer centre.

As a result it was possible to finance the whole of the thriving UK programme of some 30 projects for rather less than the cost of a single Plato system.

I should emphasise that my criticisms of CAI do not apply to all US projects (Alfred Bork at the University of California, Irvine, would be a notable exception, among others), but it could *hardly be denied that large* CAI systems form the mainstream of US activity in this area.

As for the charge of insularity, it was because NDPCAL and their supported projects were well informed about US and other work that they were able to learn from the successes and failures of the groups who did the initial work in this field.

Finally, although Mr Barker is correct in saying that a great deal of information is publically available on such systems as, for example, Plato and TICCIT, it should be pointed out that most of this is concerned with their technical implementation in hardware and software. Relatively little is available concerning the educational evaluation of such systems, except in rather narrowly financial terms.

ROBIN SHIRLEY
Department of Chemical Physics,
University of Surrey,
Guildford.

Printouts of King of rock'n roll

I WAS very interested to read your article on a computer program which altered the facial characteristics, on printed output, of Groucho Marx, so that he finally looked like Elvis Presley (CW, September 1).

Following the recent death of Elvis Presley, I have received requests for a computer printout similar to the one just mentioned. Would it be possible for any Computer Weekly reader to put me in touch with someone who could supply me with a few copies of an Elvis Presley printout?

M. LEECHMERE
5 College Road,
Moseley,
Birmingham B13 9LS.

THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

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Speeding council house allocations

A COMPUTER based housing allocation scheme is to go live in Manchester at the end of the month. The system will ease administrative congestion at the city's town hall, as housing applicants will no longer have to go there to find out how far their application has passed through the administrative procedures.

In future the 25,000 people waiting for council accommodation or for a transfer will go to one of 16 district offices, each of which is being equipped with an ICL 7502 terminal system serving two display units and a printer.

The 7502s are being linked to the city's System 4/72, which holds details of applicants' circumstances and of the housing available.

The system is one result of a computerised houseing management project started by six cities, including Manchester, with help from the consultancy Logica (CW, March 11, 1970).

The first part of the project, a feasibility study, was funded by the government to the extent of £60,000, but the project got no further.

One of the problems was that the cities were not over-willing to co-operate with each other.

NEWS IN BRIEF

Tearing down the walls of mystique

A COMPANY which sells small office computers over the counter from a shop in Carshalton High Street in Surrey has been formed by two ex-NCR men and the former London branch manager of Logabax.

The company, Data Systems Electronics, said that small systems such as the Logabax 2010 "cry out for a down to earth across the counter approach to selling."

The firm hopes that its "computer shop" approach will "tear down the walls of mystique, buzzwords and complexities which normally face the first time user."

THE time sharing services offered by the US bureau Boeing Computer Services have been upgraded with the addition of a fourth IBM 370/168 at the company's centre in McLean, Virginia. The services, which include APL, are available to UK users via the company's UK subsidiary, which also runs an ICL 1904A in Watford, Herts.

APPLICATIONS software for the distributed network ordered by Shell UK Oil from Mini-Computer Systems (CW, July 21) is to be developed by CAP. To help carry out the work, CAP has installed a Micos system comprising a 32K byte processor, 10M byte disc drive and four VDUs, in its London offices.

RECORD sales for the financial year ended June 30 have been announced by Technicare Corp, the parent company of Ohio-Nuclear. Sales for the year were $164 million (£94 million), up 71% over the previous year, with $125 million (£71 million) of this made up by *Ohio-Nuclear*, Technicare's medical diagnostic imaging subsidiary.

HAVING established a sizeable user base for its Logout and Boost products in the US, the London-based software house Macro 4 is releasing its Speed disc processing aid on the US market. The company is also reported to be considering an export venture for at least one popular set of software products from another UK company.

A NEW data preparation and computer supplies company called Excel Data has been formed by MacArthur Cunningham, formerly operations manager with Esco Computing. Excel's address is 150 Holland Street, Glasgow, G2 4NA. Tel: 041-331 2777.

Ferranti on the move

THE Military Systems Division of Ferranti has moved home from the company's factory in Wythenshawe, Greater Manchester, to a new location four miles away in Cheadle Heath.

The new home will house design, development, systems commissioning, quality assurance, manufacturing and sales operations, while the Division's service department will remain at Cairo Mill in Oldham.

The new address for the Military Systems Division is Bird Hall Lane, Cheadle Heath, Stockport. Tel: 061-428 0771. Telex: 666803.

2960 for trading group

INTERNATIONAL shipping transport and distribution company, Ocean Transport and Trading, has replaced its ICL 1903A with an ICL 2960 at its Liverpool headquarters.

The new machine will support a terminal based network which is being installed at various sites in the UK, and which will be used to extend management planning facilities and to implement some new systems, such as a company-wide management information system. It will use DME.

Prime shared

A PRIME 400 has been bought jointly by Distributed Data Processing and Systematics International, both of Basildon. DDP will use the system to expand its services to scientific and engineering users, while Systematics International will develop an online database of marketing statistics.

New bureau in Central London

A NEW computer bureau has been formed in central London, where high office and staff costs have forced other companies into the suburbs and new towns.

The bureau, Delta Computer Services, believes that its main customer targets — companies with their own programmers looking for machine time — and the fact that it runs an IBM 360/75, will enable it to survive the economic problems of running a business in central London.

"There is a definite need for OS machine time in central London," said Royston Ballan, one of the partners. "There is very little other than Datasolve and Lowndes-Ajax, and even Lowndes-Ajax is out at Croydon.

"Our computer is a 360/75 which, being an old machine, has already been paid for, whereas a bureau cannot make a 370 pay. A 370 costs more to install and run. At the same time our 360/75 gives as much power as a 370/155."

Ballan added that Delta was not specialising in particular application areas but was aiming to provide computer power to organisations with their own programmers. "We don't want hordes of our own technical people around. They cost a lot of money," he said.

Ballan was previously with Telex, where he says he put the company's bureau on a sound footing.

His partner, Brian Green, has spent the last five years in a number of management posts at Univac.

Potential customers will find Delta in Newman Street, W1, running the 360 under OS/MVT by day and DOS at night.

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For the DP Manager who is looking for reliable, cost-justified solutions in his DP environment, the IBM Series/1 offers big performance at a low price.

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Its flexible communications capabilities enable the IBM Series/1 to accept an important role in DP—as both a network controller and remote work station. And you'll be surprised how quickly it can be installed and working.

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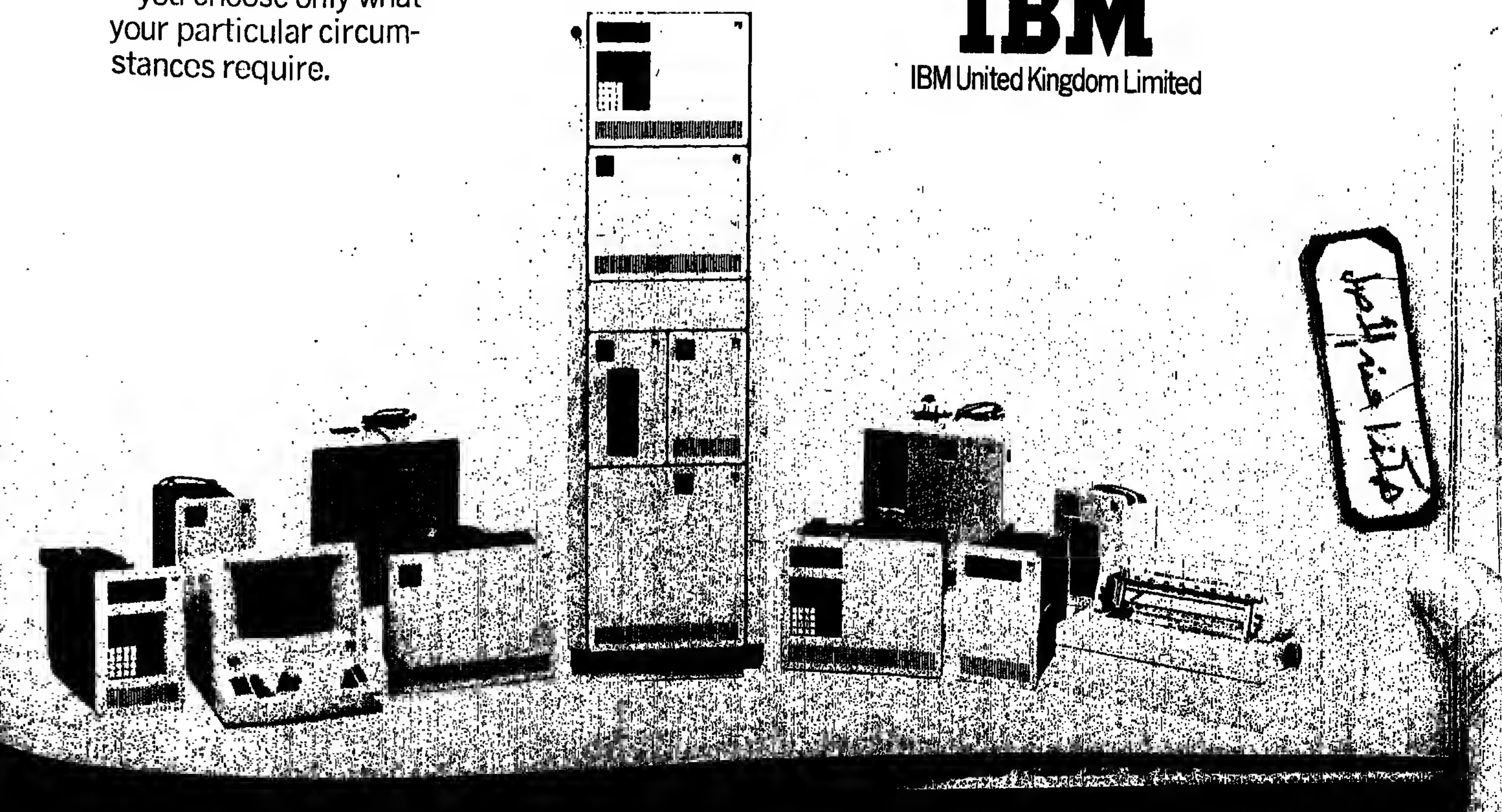

Argos to install in-store system

AS part of its expansion programme, Argos, the Green Shield stamp company's catalogue showroom chain, is to install computer systems worth over £200,000 at the 20 new showrooms being opened later this year and early 1978.

Each showroom will have a Comet 1608 computer with 24K main memory handling up to eight Comet terminals. These terminals have calculator-like keyboards and both they and the computers are made by Comet Computing Systems of Bedford.

With the new system, sales assistants using the terminals will make stock level and price inquiries.

The stock level of any item is displayed on the terminal together with the price, and the assistant can key in the quantity the customer requires. This order is then printed out in the stockroom instructing any of the storemen to pick up the item and load it on a conveyor belt.

Better management information will then be available to the store management as stock movements can be followed, and one future application could be routine stock re-ordering from the main warehouse by each branch storeroom.

By using this system, Argos is hoping to minimise costs by gaining a better picture of its constantly changing merchandise situation.

Dr Mike Smith, Argos director of marketing (left), and Rex Ingram of Comet, talk with one of the sales assistants at the Argos catalogue showroom in Oxford.

£750,000 LesterNet order for Burroughs

TO the outside world, all building societies may look similar, yet each one takes a completely autonomous and individualistic view of the best ways to meet the requirements of its customers.

While pioneering societies like the Britannia believe that real time passbook updating at branch counters is the shape of things to come for the whole movement, others like the Leicester believe that offering a comprehensive savings bank service is less important than providing an efficient savings and loan service as cost effectively as possible.

The Leicester is installing a nationwide network of VDUs, one at each of its branches, but has decided against real time file inquiry and updating on its twin Burroughs B3700 installation at Oadby, Leicestershire.

Instead, each day's transactions will be transmitted throughout the day to the mainframe, but will be checked and batched up on disc for overnight processing; online file inquiries will be answered with the previous day's balances.

"A real time passbook updating system would be much more expensive than we are planning, and real time file updating would also be much more demanding of systems effort," Paul Rylett, computer manager at the Leicester told Computer Weekly. "We simply don't believe that the extra cost is justified at present."

In order to implement the new network, the Leicester has placed a £750,000 order with Burroughs for 170 TD 833 VDUs, three B774 front-end processors and 192 TA 2401 modems, which have just been given the UK Post Office approval.

The Society estimates that over a five-year period its modem cost will be 50% of what it would have been if it had rented 2400 bps devices from the Post Office. It is Burroughs' first UK order for the TA 2401.

Two of Burroughs' special software aids are being used to implement the Society's communications system, called LesterNet.

Burroughs' Network Definition Language will be used on the B774s for generating the operational software, and will communicate with the Burroughs Message Control System on the B3700s.

The B3700s are expected to meet the Society's requirements for two to three more years, with the addition of further memory and peripherals, after which there will be a full evaluation of hardware available at that time.

The Leicester Society was formed by an amalgamation of the Leicester Permanent and the Leicester Temperance Building Societies. The Leicester Permanent was the first to install a computer in the early 1960s, and switched to a B3500 in 1971 while the Temperance used the Centrefile bureau, running its files on IBM hardware; these have all now been transferred to the twin B3700 system.

Low cost Scrumpi II

A REVISED version of the low cost microprocessor development system, Scrumpi, has been introduced by Bywood Electronics. Known as Scrumpi II, the system offers several enhancements for the old price tag of £58.

The main differences between Scrumpi I and II are the addition of 512 bytes of PROM and 912 bytes of RAM, edge connectors and wire breaks in the busses for external connections, and the use of the National Semiconductor, SC/MP II microprocessor (CW, August 11). One of the edge connectors carries the busses for connection to external systems.

Although still programmed in the same way as Scrumpi I (CW, September 8), using mode and data switches, Bywood is also working on the development of a keyboard and display unit that will act as the I/O device for Scrumpi systems.

Based on the use of a National clock chip, used primarily for its display and driving capabilities, it will offer the potential of a high complexity time control system, capable of triggering up to 160 different command signals in a 24-hour period, which could make it well suited to many industrial applications.

Announcing CA-SORT Release 5.0

Enhancing CA-SORT twice a year gets harder all the time.

That's because we've been at it every six months for the last six years and the package has achieved a level of performance that becomes increasingly more difficult to improve on — as even our competitors will admit.

But we keep on trying anyway — and maybe that's why we're pushing the 2000 user mark worldwide.

Release 5.0, for example, brings a number of improvements in sort performance, I/O management and flexibility.

There has been a further reduction in I/O accesses through extension in the command chaining logic.

String extension techniques have been enhanced and the sort has been finely tuned for VS through use of monitor systems.

Full support of 3350 disks (as provided by IBM Release 34) is now available and, under DOS, support for multiple input devices (tape and disk) is now provided.

Finally, DOS users may now profit from optimum work device assignment through automatic resolution of work I/O device conflicts.

IBM users in 28 countries continue to switch to CA-SORT at the rate of about 100 a month. There must be good reasons.

You can determine easily for yourself what these are. CA-SORT is available for a 14-day evaluation entirely without charge.

It takes about 10 minutes to install without interruption to any work in progress. Why not call your nearest CA office — or mail the coupon to us today for a prompt reply.

COMPUTER ASSOCIATES

DATAPRO, a well-known American research organization, conducts a survey each year to determine the most valued software packages in use in the USA. To our knowledge, CA-SORT 77, a two-time winner, is the only European package to achieve this coveted award.

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Shape of devices to come from Zilog

FURTHER information about the eight-bit single-chip microcomputer and 16-bit "number crunching" micro were given last week by Ralph Ungermann, executive vice-president of Zilog, when he spoke at a seminar at the Lorch Foundation, near High Wycombe.

The Z-8, eight-bit device (CW August 4) is now scheduled to appear in quantity in March. Intended primarily for stand-alone applications, particularly where system memory requirements are small, the device has an on-board memory capacity of 2K bytes of ROM and [illegible] bytes of RAM, together with 32 I/O lines.

Seventy-six bytes of RAM are available as general purpose read/write memory. The 32 I/O lines are formed into four ports, in which reside the remaining 20 bytes of RAM. Of the four ports, two are constructed as full eight-bit units, while one is four-bit in four-bit out. As the I/O ports contain the remaining registers, the device allows several data manipulation functions to be carried out in the ports rather than the other internal registers.

All 32 lines of I/O can be used for external memory addressing, offering a total capability of 128K bytes, equally divided between program and data storage. In addition, two of the lines can be used to form a simple universal asynchronous receiver transmitter, UART, serial I/O port.

Other features include an internal vectored multi-level interrupt system, two timers and a pre-scaler for timing and event counting, and a single five-volt power supply requirement. Plans are in hand from Zilog for the introduction of an add-on module for the MDZ development system to accommodate the Z-8.

Similar plans are afoot for the Z-8000, the official designation for Zilog's oft-predicted 16-bit microcomputer. Currently planned to appear next June, the design would appear now to be settled, as the layouts for the production masks are being finalised.

Ungermann, without being drawn too specifically, offered the seminar delegates an interesting overview of the device. However, as already predicted (CW, October 13), its throughput capabilities will be broadly similar to that of the PDP-11/70 minicomputer, and will employ a similar architecture.

Its instruction set will be compatible at assembly language level with the Z-80 device, and it will offer such facilities as hardware multiply and divide. Available in either a 40 or 48 pin package, Ungermann predicted that in the latter version, it would be possible to directly address up to 8M bytes of memory. On the question of price, Ungermann would only state that it would be competitive with the LSI-11 CPU from Digital.

Practical guide for managers

PRODUCTION control systems are covered by two new books* from the National Computing Centre.

The first, part of the Computerguide series, is a practical guide which identifies problems and helps managers to get the best from their systems.

The guide is needed because the NCC says that, despite long experience in the field, industry still makes the same mistakes especially during system implementation.

The other book is an update of an earlier NCC survey of 12 production control packages.

*Computerguide 18: Production Control Implementation. 43 pp. £3.50. Factfinder 13: Production Control Packages and Services. 156 pp. £1.50. J. M. Dent & Sons (Distribution) Ltd, Dunhams Lane, Letchworth, Hertfordshire, or from technical bookshops.

Three more reasons why ITT Business Systems means business.

These are the three latest additions to an already extensive range of data communications products from ITT Business Systems.

Individually, they offer you a new and extended capability based on the latest computer technology. Each of them can help to make your life easier and your business more efficient.

But collectively they have something more to say – they demonstrate that ITT Business Systems really does mean business.

That's important because it means there is one supplier of computer peripherals large enough to lead the way. A supplier, moreover, with the technical resources and nationwide sales and service organisation to provide a real competitive edge.

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ITT 3805 Programmable Communications Controller

The ITT 3805 is a comprehensive and powerful programmable communications front-end processor for attachment to IBM mainframe computers. It provides flexible network control and enhanced networking without the need to change tried and tested applications or mainframe software.

The 3805 will also allow greater choice of communications techniques in the future and can show significant savings in network costs.

ITT 3630 Multifunction Intelligent Terminal System

The ITT 3630 is an intelligent terminal system. It can be used as a remote batch terminal or, simply by changing a diskette, as a data entry system, or an interactive terminal.

These functions are supported by advanced, proven software – DEGEN. This allows you to generate a data entry and transmission system. It is designed to enable more efficient data input and reduced software development costs.

System control can be located just where you want it.

The ITT 3630 is a quiet, easy-to-use system designed to look good in any office.

ITT 3230 Visual Display System

The ITT 3230 Visual Display System has been specifically designed to meet all the data communications needs of the Systems Designer, the DP Manager and, of course, the operator. It's very versatile, good looking and above all, cost-effective. No equivalent system offers so many features at a comparable price. The ITT 3230 with its diskette attachment is particularly suited to file enquiry and update although many will see it in a data entry role.

Other ITT Business Systems products include: ITT 3802 Terminal and Communications Controller · ITT 3330 and ITT 2300/8 Data Printers · ITT 3280 range of 3270 compatible Displays and Printers · ITT 2000 series of Modems.

ITT Business Systems, Publicity Department,
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ITT Business Systems ITT

Tim Palmer and Robin Webster report from Birmingham

The benefits of electronics in the office

"THE impact of electronics on the business industry has been quite extraordinary," said the Duke of Kent when he opened the International Business Show at the National Exhibition Centre at Birmingham last week.

"We hear a lot about improved productivity, but it is useless unless it is supported by proper administration. Foreign customers are quite unforgiving about mistakes and quite rightly so," said the duke.

With office and commercial applications getting top priority word processing systems were shown by several companies and interest in the show confirms this opinion. Attendance was up on previous Business Efficiency Exhibitions. For the first four days of the last BEE in 1975, there were 14,819 visitors, compared to 18,212 for the first four days of the IBS.

One of the focal points was ICL's Computer City which dominated Hall 1. This received a great deal of attention from visitors, including the Duke, and the wide range of business systems on show emphasised their operations by "unskilled users".

Monotype International used the IBS to launch its Monotype 80 system. Manufactured by the Ontel Corp in the US as the Ontel OP1 terminal, it includes an intelligent VDU, a 45 chps daisy wheel printer, and a dual floppy disc drive. Designed for stand alone or distributed processing mode, the system offers a range of printing facilities including superscripts and subscripts, continuous or broken underlining, file merging and proportional spacing. There is a standard software package. Monotype can also supply packages using Basic and Sabcol, a business oriented language. There are also data capture and communications emulator packages.

Altergo Computers introduced Formula 1, its word processing system based on the Intel 8080. To promote this racing driver Divina Galica and her Formula One racing car were featured on the altergo stand (see Page 11).

One of the more impressive of the small business systems on offer was the Jacquard J100, marketed in the UK by Computer Ancillaries Ltd. It is one of the first business systems to be based on a 16 bit microprocessor, rather than an eight-bit one. The device it uses is the National Semiconductor IMP-16.

The J100 was demonstrated running word processing on one of its four VDUs, while file inquiry and order entry applications were carried out simultaneously at others.

The configuration shown, including 64K 16-bit words of memory, 12 Megabytes on disc and two printers, would sell for about £40,000 including the operating system and text processing software. Programming is in extended Basic, and disc capacity can be expanded to 96 Megabytes, which makes the system attractive to people running heavy text applications.

One user, Database Technology of Aldershot, is using a J100 to provide a text processing bureau service, and two Lloyds underwriters are making use of the facility for preparing standard letters alongside standard data processing applications.

Computer Ancillaries also showed systems from the Mael range, which still account for half its annual business of about £3 million; the other half is split equally between Jacquard and CAL's M-ONE stock control system, which was designed in-house.

The J100 is the fastest-growing sector of Computer Ancillaries' market, and more have been sold in the UK than any other European country. Jacquard looks for Europe-wide sales of 90 to 100 by the end of the year, and Computer Ancillaries expects to sell 50 in the UK next year. Five software houses have bought Jacquard systems and are developing applications packages on them.

The M-ONE was not on show at Birmingham because Computer Ancillaries has sold all of this year's production and much of next year's.

NCR showed the new 8250 small business system, which is based on a general-purpose 16-bit minicomputer. Compared with the 8200, which it succeeds, it has an enhanced transaction-processing operating system, IMOS III, which features dynamic allocation of memory where IMOS I on the 8200 operated on fixed memory partitions. The present software supports up to seven VDU or printer terminals, and a new release due to be introduced soon, will extend this to 15.

Cassettes are the preferred medium for program loading, but floppy discs are an optional alternative. Cartridge discs offer 4.9 Megabytes, and fixed discs come in 4.9 or 9.8 Megabyte units. People wanting to run the B-series batch operating systems used on the Century 75 and 151 can do so on the 8250 in emulation mode, running programs in Fortran, Basic, Cobol 68 and Neat 3. Programming under the native IMOS III operating system is in the NCR standard, Cobol 74.

There is one other machine in the series, the 8230, but this is simply an 8250 with slower execution speed, configured thus for marketing reasons.

IMOS III is also the native operating system for the 8400 series, which succeeds the mid-range Centuries, and it will also run on the smaller Criterion 8500s, whose native operating system is Virtual Resources Executive, VRX.

Computer Technology exhibited a bank of VDUs, all linked to an 8050 minicomputer, and visitors were invited to put the computer through a number of applications all running in multiprocessing mode under the Modus operating system.

Datasaab gave the new magnetic ledger card version of the D12 desk-top accounting machine its first UK airing. It is sold mainly through agents and costs about £9,000. The company also demonstrated a three-site telephone order taking system implemented on the D15 for a West Country motor tyre stockist. The specially written software costs about £10,000.

After opening the show the Duke of Kent toured the stands. Here he watches as a futuristic secretary on the Pitney-Bowes stand takes part in a demonstration of a computer-based mail franking machine. When the machines need to be refilled the user can get the meter reset by dialling into the Pitney-Bowes data centre and entering his account number, meter number and the register readings. These details are checked for validity and a voice-response system then issues a setting code for the meter. The code sequence is random to ensure security.

Dominant stand at the show was without a doubt the shining silver Computer City of ICL, which occupied the central site in the computer hall and to which visitors were welcomed with the smiles shown here. Lest anyone should criticise the flagship of the UK computer industry for such a display of opulence, it should be pointed out that the stand will become the permanent showcase for the company's products at Hanover Fair in West Germany, where it will also be among the most eyecatching exhibits at the show.

Carpets and the cost of tea

In most respects the National Exhibition Centre is an excellently appointed show centre as most exhibitors at the International Business Show would agree. But it would have looked incomparably better if the aisles had been covered with some form of carpeting, and a few pots of shrubs and flowers could have been used to mask some of the unsold space. It would also have helped if the stand plans displayed at points around the show had included names of exhibitors as well as stand numbers.

A thing that stunned exhibitors who were at the NEC on Monday to set up their stands, and returned on the opening day, Tuesday to greet visitors, was the astonishing inflation in the price of refreshments.

Overnight the price of a cup of tea rocketed from 8p to 12p. The explanation was that the workers who set up all the shows at Birmingham are not prepared to pay 12p for a cup of tea and they get a specially reduced price. Unfortunately many exhibitors staff and visitors were not prepared to pay 12p and so went without.

COMPUTER WEEKLY

The following special supplements are due to be published during

NOVEMBER

NOVEMBER 3
COMPEC PREVIEW
+ Bonus Preview

Following the resounding success of Compec at the Wembley Exhibition Centre last November, the show returns to the same venue next month with an even bigger line-up of companies eager to promote their wares. The show runs from November 8-11, and will be the subject of a supplement in Computer Weekly on November 3, when Computer Weekly as sponsors and owners of the show will be exhibiting and 6,000 additional copies of the issue will be distributed.

Topics to be covered include how microprocessors assist the peripheral manufacturer, how users are being used to change intelligent terminals into distributed processing systems, whither goes the mini-computer? threat from micros? are minis taking over from main-frames? marketing low cost commercial microprocessor systems: limitations of microprocessors, why U.S. exhibitions are more exciting than UK shows

NOVEMBER 10th
INTERNATIONAL
EDITION

The November issue of Computer Weekly International will feature a detailed report of System 77, which was held in Munich, Germany, this month. Together with all the latest news and developments which has occured during the past month in other parts of Europe and the U.S. With an overall distribution of over 88,000 (U.K. 78,885, Overseas 19,138) this issue will provide an ideal opportunity for export minded companies to display their products, equipment and services to this unique audience of decision makers throughout Western Europe.

COMPUTER EDUCATION —
NOVEMBER 17th ISSUE

Computer education is not just teaching fifteen-year-olds the difference between a punched card and paper tape or showing them how to program in Basic.

For although, happily, computer education is starting earlier and earlier in our schools, possibly the biggest education job still has to be done among adults.

Our education supplement on November 17 covers both sides of the problem, with the spotlight first going on the Inner London Education Authority to show what can be done at school level then articles on the government's TOPS training scheme and the National Computing Centre's Threshold training scheme for school leavers

There will also be a look at the problems of educating the end user about the firm's computer department. And details will be given on the Plato computer assisted instruction system now being introduced to Europe by Control Data. Read Computer Weekly on November 17 and learn something

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Stop Press: Computer Weekly continues to publish more product and recruitment advertising and has a higher fully requested A.B.C. (Audit Bureau Circulation) of 76,001 than any other U.K. computer publication.

* Additional 19,138 regular readers in Western Europe via the INTERNATIONAL EDITION which is published the 2nd week in every month excluding August and December.

Visual Display Units

Edited by Derrick J. Grover
Chairman, British Computer Society Displays Group

Visual display units provide one of the fastest means of interaction with a computer, and they are being employed in industry in ever-increasing numbers. Their applications are wide-ranging, including airline-seat reservations, stock-control systems, information retrieval, stock-market and insurance quotations, text editing and information updating.

VISUAL DISPLAY UNITS is based on a tutorial seminar organised by the British Computer Society. The book is intended for computer users who already employ VDUs or plan to use them to enhance their system. It will be of equal value to management in their basic decision-making, and to the systems analysts and data-processing managers who put those decisions into practical effect.

contents
Review and trends *Derrick Grover, British Computer Society*
Technology of VDUs *[illegible], Cossor Electronics*
Communications *Peter Barton, CASL*
Intelligence *Ian Richards, Ferranti*
Software *[illegible]*
Human factors in the design of VDUs *[illegible], IBM*
Human factors in the use of VDUs *Tom Stewart, Loughborough University*

The book also includes an extensive glossary of VDU terminology.

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The secrets of Enigma

THE importance of Colossus, the world's first programmable computer (CW, July 28), to the Allies' victory in the Second World War should become clearer now that secret German messages decoded by the UK computer have been made available for public study at the Public Record Office at Kew, West London.

The messages, obtained by secret agents and by intercepting radio transmissions, are expected to shed new light on the Battle of the Atlantic and D-Day.

Pactel reports

A NEW annual series of reports aimed at manufacturers of computers and telecommunications equipment are being launched by Partel. Costing $995 each, the reports will provide information and analysis for short and long term market planning. Each will cover a separate section of the industry, and the first, Computer Mainframes, is due out this month.

Other subjects, following at monthly intervals, will be microcomputers, minicomputers, small business systems, computer terminals, data transmission equipment and business communications.

Nixdorf picks Z-80

LATEST long term Intel 8080 user to switch to the Zilog Z-80 microprocessor is Nixdorf Computer, which is using the Z 80 in peripheral controllers and as CPU in some of its terminal systems.

Last month microcomputer pioneer R2E of France announced that it was switching to the Z-80. "The Z 80 has a *larger instruction* set than the 8080, is five to six times more powerful, and only requires one power supply," Thi Truong, R2E founder and president, told Computer Weekly.

Formula 1 girl at a Formula 1 keyboard. With a suitably attired team, racing driver Divina Galica was at the Altergo "pit" at the IBS to promote the company's latest venture.

Exports now major part of Logica

WITH the UK computing services industry placing increasing emphasis on the importance of the export market, the publication of Logica's latest annual results show the company's overseas business overtaking its business in the UK. Overseas turnover now represents 51% of Logica's total dealings.

The company emphasises its intention to continue this overseas expansion. Chairman, Phillip Hughes declined to be tied down to specific further plans for Logica subsidiaries, though he admitted that further offices were likely to be set up. There were hints that the next area to be approached in this way would be West Germany.

At present Logica has subsidiaries in Benelux, where its holding company is also situated; Sweden; the US; and Australia. The company is also handling projects in a variety of other countries, including the Middle East.

Logica's turnover for the year ended June 30 is £8,842,915. This represents an increase of 52% over the same period last year. After-tax profit, at £269,495, shows an even more impressive increase of 144%.

This growth, claimed Hughes, is due largely to the increased enthusiasm by users in general for two areas in which Logica has long been accumulating expertise — the hardware-software interface and communications and linking technology.

Consultancies which, until now, had specialised entirely in software were finding themselves thrown into hardware design through the advent of the microprocessor, with its more intimate connection between software and hardware architecture, said Hughes. Logica's existing hardware design expertise had placed the firm well to meet this "revolution".

"For us," he said, "the advent of microprocessors is just a further link in the chain. In the past two years, without fuss, Logica has steadily incorporated microprocessors in systems for the UK government, British Rail, Reuters and Euronet, as well as in our own internal developments."

Logica's present strong overseas position is underlined by Department of Industry figures, which indicate that Logica UK's exports of professional computer services account for 25% of the UK's total exports in this field.

Consideration of exports naturally raises the subject of the National Enterprise Board's Insac subsidiary. Although Logica admits that "we cannot be but interested in Insac," Hughes added that the company is at present "in no sense negotiating" to join the venture. "Looking at our figures," he added, "we don't really need the funds."

Altergo bid for business market with Formula 1

Progressing towards ever smaller systems, Altergo Computers launched its first microcomputer last week at the International Business Show. Known as the Formula 1, it is aimed at the word processor, general accounting and communications markets.

Like Altergo's minicomputer configuration the Avenger (CW, June 16), the Formula 1 is built of components from several sources. The central processor is an Intel 8080, and the configuration has a keyboard, a visual display unit supplied by Motorola, a twin floppy disc unit from Shugart, and a 40 chps daisy wheel printer from Diablo.

Software from Altergo includes word processing programs, sales ledger, payroll and time-recording systems. There is also an IBM 2780 emulator, allowing the Formula 1 to be linked to a variety of mainframes in a distributed processing configuration.

The combination of word processing and accounting software on the same machine should prove attractive to businesses and professions needing to prepare standard documents.

Time-recording, enabling professionals such as accountants and solicitors to record the time spent on each of a variety of simultaneous assignments, is also available. Time-recording systems have proved very popular, and have already been implemented on a number of minicomputers.

Additional software will be provided for the Formula 1 as users express a need for a particular application, says Altergo.

The price of the basic Formula system is £8,500.

NCR faces Century suit

A SUIT for $3.2 million damages has been brought against NCR in the US by a user who claims to have had hardware and other problems with a Century 200.

The user, Tri-State Engineering, a manufacturer of wire mesh containers, says the $3.2 million includes $322,075 for the cost of the Century 200 and $1.5 million for loss of profits, loss of service bureau business and for additional borrowing costs. Tri-State transferred to the Century from an IBM 360/20. It now runs a Univac 9600.

AJ's high quality matrix printer

A WIDE-CARRIAGE dot-matrix printer terminal introduced by Anderson Jacobson, has been designed to provide a high level of print quality, at speeds up to 120 chps. Called the AJ860, it costs £1,995 in its basic form and is available on 12, 24, or 36 month leases.

The 860 can run on- or off-line, at 10, 30 or 60 chps and options include graphics capability, and the 120 chps facility which costs £375.

OP SPOT

To get the best out of an installation one must define the users and understand their needs

Narrow view... or plain guide?

BEFORE taking on the Op Spot mantle I endeavoured to outline the optimum way of organising and running the computer room. In "The Plain Man's Guide to the Computer Room" (CW, September 8), I discussed topics such as communication, throughput, operator training, and general methods of encouraging and enhancing efficiency.

Now, David Flint, a systems analyst at the Post Office, has taken me to task and says I presented "a depressingly narrow, and depressingly common, view of the responsibility of the computer operations function".

He goes on, "The danger in Mr Allen's formulation of the operations function is that it slights those jobs that are not online, and it obstructs communications between operations and users. It also encourages the view of computing as an end in itself rather than as a way of meeting users' needs. It is time that operations units abandoned this 'ghetto approach'. Indeed many have already done so," he adds.

I do not see how Mr Flint drew the conclusion that the approach I suggested could "obstruct communications between operations and users". I did, in fact, say that "the role of the job control section is basically that of co-ordinator between the user and the computer room".

In my view operators should be able to concentrate fully on their task — operating the system. If they are continually interrupted by interference from outside the computer room, their performance will be diminished.

Any communication between users and the computer room should take place via the job control section. In this respect good documentation is of vital importance. Such documentation can relate the particular needs of each user and can inform the operators of such things as priority, deadlines and any special user requirements.

Dealing with Mr Flint's criticism that my article "encourages the view that computing is an end in itself", I was trying to establish criteria by which an operations department could be judged. I said that "the most *important* factor is the service given to the user".

But Mr Flint also disagrees with my definition of a user as "basically, someone who is buying machine time". He says "this is only really true of the user we are most familiar with — the programmer. And even the programmer is buying service as well: the correct loading of tapes and stationery and appropriate action to clear transient failures for instance".

Regardless of the manner in which one defines the user, I believe a high level of technical expertise, good training schemes and financial incentives to operators can only improve the service provided by operations.

Sheffield shifts

NEGOTIATIONS are in hand to set up three-shift working on the IBM 370/135 installation at Sheffield Polytechnic. The present shift system provides cover from 8.40 am to 9.40pm, Monday to Friday.

The need for three shifts has arisen because of an increase in the number of long running jobs. The department provides a service to every course run at the polytechnic and the students submitting the long jobs are mainly those involved in engineering and chemistry.

Grenville Morgan, the poly's director of computer services, who is responsible for the development of the department, says that due to cuts on local government expenditure, he is unlikely to be able to upgrade the hardware and will not be able to increase the size of the operations staff in the near future.

At present the operators receive a 14% shift allowance, which will be increased to 18% should they agree to go to three shifts.

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USER FORUM

A page in which users can air their views on issues affecting day-to-day data processing. Edited by John Kavanagh.

Damage to data is the biggest threat

UNAUTHORISED insertion, modification and destruction of data are by far the biggest threats to computer installations. This is clear from a study by the Stanford Research Institute of 355 cases of malicious and accidental damage at computer sites.

The study found that 27% of cases involved the insertion, modification or destruction of data and program files held in a computer system and 24% involved data stored outside the system.

Unauthorised use of computer time was next with only nine per cent and vandalism, forced entry and theft of hardware, software and supplies each accounted for eight per cent of cases.

In total, malicious damage was involved in 90% of cases, with both accidents and natural disasters accounting for as little as four per cent.

The study identified different types of safeguard and found that there were far more possible safeguards against data manipulation than against other types of damage.

But at the same time the study found that only 20 per cent of what it called highly-effective safeguards were also broadly applicable, and that many were only applicable to a small area in a risk category.

As the study report says, "It was hoped that the safeguards would have fairly broad applicability within a violation category. However, the narrowness of their applicability within categories means that a facility must employ a set of safeguards to protect against a particular type of threat, even though each of the safeguards might be highly effective in its action."

Most of the high cost safeguards relate to hardware, communications and to the physical security of the installation. The low cost safeguards tend to relate to procedures at an installation or in the computer room.

As the report says, "It is thus important to have a solid policy and procedural foundation for any programme to enhance computer system integrity. The moderate cost safeguards tend to relate to the system safeguards in the computer operations area, particularly to operations controls and password mechanisms."

USER VIEW

'It's too risky saving money'

THE IBM-compatible mainframe manufacturer Amdahl has chosen the UK as one of its two main European bases because it sees the UK as the best potential market (CW, August 25).

But the attitude of the UK data processing manager could prove this argument wrong, according to one major UK user.

The user, who took part in the Computer Weekly survey on attitudes to plug-compatible processors (CW, October 6), said, "If we buy an Amdahl processor, and thus save our company money, we get no credit. And if it goes wrong we get jumped on from on high. So there's no incentive to move from IBM."

Another aspect of this attitude was pointed out by Bill Read, managing director of Univac (CW, September 8). He said, "US companies are much more cost-conscious in all areas and price is very important . . . The UK manager tends to take the attitude that if it's the company's money, his spending cost is not of prime importance."

As well as being unprofessional, this attitude could lead to a vicious circle, with the likes of Amdahl having trouble getting a foot in the door, and the IBMs of this world getting a stronger grip on the market.

And why should the data processing manager worry about what the company is going to think about him if his plug-compatible machine, bought on his advice, isn't a great success? The DP department's name is probably mud in the company anyway because of all those application systems which were delivered late and keep going wrong.

So why aren't you all rushing out to get plug-compatible machines to replace your mainframes? Is it fear of failure? Or lack of confidence in the suppliers? Or have IBM and the others done such a good sales job that you just haven't thought of it? User Forum would like your views on buying or not buying plug-compatible machines.

These glass bottles are about to be packed automatically in cartons at one of Verlipack's factories. The production of bottles, the testing and packing is all done automatically and the main hold-up in the past was the manual handling of details on stocks. This, too, is now done automatically by the MTS 7500 terminals.

Emulation keeps Belgian glass manufacturer happy

WHEN Honeywell launched the Series 60 over three years ago, one claim made for the small to medium sized 64/20 was that it could run in G-100 mode, thus giving users of the General Electric computers taken over by Honeywell a chance to transfer easily to the new main Honeywell line.

Many of the early level 64 customers were G-100 users and one of them, Verlipack, a Belgian manufacturer of glass and plastic containers, is happy enough about running in G-100 mode to put off conversion to native Series 60 mode until it has sufficient resources available for the job.

And not only has the company, part of the Franco-Belgian engineering giant Empain Schneider, been able to transfer its programs directly from its old G-136, but it has at the same time been able to take advantage of the 64/20's communications facilities and give its factories and administrative departments online access to the central machine.

"We use the G-136 programs unchanged on the 64/20," said José Schmitz, head of computing at Verlipack. "And most of the programs run 20 per cent faster on the 64/20 in G-100 mode than they did on the G-136.

"The emulation software takes almost 100K of memory, but the software is free. We also pay 20,000 Belgian francs, or £2,850 a month, for firmware."

The cost of running in G-100 mode is sufficiently low to prevent Verlipack from regarding program conversion as a top priority. In fact Schmitz has not even given a firm completion date for conversion.

Verlipack is more immediately concerned with getting its six factories and eight main administrative departments online. It is notching up something of a first here, as it is the first user to link Honeywell's MTS 7500 terminal systems to a level 64 computer.

The MTS 7500s are in the factories and used to record information on staff working hours and on stocks. The transmission of data to the 64/20 in Brussels is done nightly so that files are always up-to-date, whereas formerly the data was sent manually, punched on to cards, processed and sent back to the factory for error checking. It was sometimes a week or even 10 days before stock information was recorded centrally.

A final word on the emulators came from Honeywell: as a spokesman pointed out, explaining the number of satisfied users running under G-100 mode, "We have been through a lot of mergers, what with General Electric and Machines Bull, so we have a lot of experience in emulation."

PROFILE

George 2 Group

THE George 2 user group, part of the ICL Computer Users' Association, meets four times a year in London, Birmingham and Manchester. The meetings give the group's 170 members the chance to exchange ideas on software, with special emphasis on the George 2 operating system on the 1900 range.

A typical meeting is divided into a number of sections, some of which include:

THE POST BOX: Members are encouraged to express any problems regarding operational software. These can relate to software other than George 2, and are recorded in the minutes of the meeting so that advice can be given from members unable to attend.

THE SOFTWARE REGISTER: This is a file of utility programs maintained by Paul Wood, of Seaforth Computer Services. These are available to members free of charge and everyone is encouraged to contribute to the register. At meetings any new additions to the file are discussed.

THE REGISTER OF EXPERIENCE: This consists of a list of people with George 2 software experience. It includes information such as a description of the installation in which they are involved and the applications supported. Any additions can be discussed and members can be contacted if advice is needed.

USERS' EXPERIENCE: Users are invited to speak about any problems they have encountered and describe how they overcame them. Members facing similar problems are then able to ask questions and seek advice.

Users say the group provides a valuable service. It enables them to make greater use of their software than would otherwise be possible.

ICL representatives attend the meetings, so direct communication is available between them and the users.

Tax forms

STATIONERY supplier PFC (Continuous Forms) of Cradley Heath, West Midlands, is now offering P11, P60 and P35 tax and National Health contribution forms as continuous stationery, with immediate delivery.

Typical prices for two-part P35 forms are £15.75 for 1,000 and £27 for 2,000. The one-part P60s cost £28.25 for 5,000, £39.95 for 10,000 and £140 for 50,000. The three-part P11/P60s cost £18 for 1,000, £38.38 for 2,500, £56.25 for 5,000 and £325 for the maximum of 50,000.

Their first—and last—taste of independence

AFTER a brief spell of independence, UK users of the Texas Instruments 990 minicomputer have rejoined the main European users' association, TI-MIX. But having proved the point that they are a group in their own right, they are rejoining as the 990 regional group rather than as individual users.

The 990 users broke away from TI-MIX in the summer, arguing that they were hardware oriented, while the 960 and 980 minicomputers were used more for data processing and process control applications (CW, August 25).

The 990 users had their first — and last — meeting as an independent association last month. Afterwards the organiser, Bill Davy of Aston University, said, "Since a user group without Texas Instruments support is of questionable value, we asked the Texas Instruments representative at our meeting if support would be guaranteed for the new group if it was within TI-MIX. To everyone's relief the answer was a very definite yes, so steps have been taken to have the group re-established in TI-MIX."

Davy added that the 990 group in TI-MIX would be the first of its kind in Europe.

"We have achieved a tremendous amount," he said.

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Not so long ago you could keep the end user at arm's length. Now people talk about "user rule". End user satisfaction has become a key objective for the DP manager and, argues NIGEL LAURIE (pictured right) in the first of a series of five articles, a key challenge.

He outlines the forces which can stunt the growth of user satisfaction — and shows how two-way communication can help both users and DP. He offers guidelines for making end user communication pay off — and predicts that before long communication research techniques will join the DP managers' armoury of management aids.

Laurie has worked for over 10 years in the communication and computing fields. After lecturing and publishing management posts he spent nearly seven years in systems engineering and communication work with IBM. Now he directs his own consulting firm Communication Audit. A member of the International Institute of Communications, Laurie lectures frequently to management audiences on communication topics.

How to communicate with the end user

IF there's one challenge every established DP manager faces these days it's the vital need to build end user satisfaction.

That end users form a growing army is a truism. That their taste for independence is well developed we know only too well. The technology lets them pursue it and they are set to become DP's not so silent majority of the future. On their goodwill much progress in DP will depend.

Managing this new found user freedom is not easy. Decrying it may be a tempting strategy but in the end is a self-defeating one. For the end user's drive to independence cannot be halted; it can only be coaxed into sensible channels consistent with corporate strategy for DP. The sound response is thus to focus on user service, not user control, user persuasion, not user direction; and user communication, not user compulsion.

Such a strategy will be built against a background of rising demands from the end user.

Meeting his needs and holding his goodwill will, therefore, call for quite outstanding skills. For, no matter how trusted the service, intensive the training and dedicated the support, users will tend to discontent. Once they *grasp the potential of computing they will demand* more from it. Their complaints then will not arise from the service they have, but they will be caused by the gap between what they want and what they can be given.

The right strategy must narrow the "expectation gap" *from both sides* — by managed user communication. It will need to deliver the best service and support it can and bring user demands into line with economic and technical realities.

We already know that frequent communication from users helps. It gives a clear view of their latest reactions. It helps DP draw up service strategies and policies which users will accept. It can prevent minor troubles turning into running sores that can hold back growth. It can make change easier to bring about.

On the user side, good communication from DP builds goodwill. It can head-off the temptation to go it alone with the wrong micro or mini, into a longer term dead-end. It can equip users to make the most of a service, exploit functions to the full and ensure they know what is and is not possible.

And much progress has, of course, already been achieved.

The sustained upgrading of communication skills by DP staff has been computing's "quiet revolution" of the 1970s. Analysts now interview with more insight, write more clearly, and make the presentation with flair.

User communication techniques have been forged in growing numbers (see figures 1 and 2 for examples). There is no shortage of methods now and the challenge each DP manager faces is finding the right "mix" for his special needs. For, when it comes to communication, every organisation has its own special character. What works well in one will not "take" in another. And the techniques with most obvious appeal don't always do a cost-effective, let alone the best, job.

While methods and skills are well applied, we still must tackle in *systematic* fashion the challenge of user education in the fullest sense. For, at the root of any communication problem one finds, if one probes deep enough, not a shortcoming of language or method but a difference of outlook or expectation. And it is the difference between the expectations and standpoints of DP staff and end users which so often leaves them as two groups divided by a common technology. It explains why much user support fails to reach its full potential.

DP specialists and end users, it can be argued, live in different worlds. Their needs are not the same. The pressures they face are tough — but come from different sources. Their outlooks differ. Their commitments vary widely — from making DP efficient and effective in the whole organisation to writing and working APL cash flow model before lunch. One group knows DP from the inside and hard won experience, the other from more limited exposure.

The first step to improving communication is to recognise these realities. The knack of successful user communication then lies in finding the right ways and means of bridging the gap between the different outlooks and edging them closer together.

Whatever approaches and techniques are used to bridge the gap, successful user communication typically displays several qualities. It will tend to:

- ● Tie in to user needs — and tell him what he needs to know, when he wants to know it and in a form he can use.
- ● Talk user language — and cut down on jargon, acronyms, "naive users" and other terms which should not be let out in public.
- ● Relate to user realities — we all know the world looks very different from the user's side of the desk. Communication which gets through is geared to the user's outlook, pressures and experience. It takes note of his attitudes.
- ● Use agreed yardsticks — if users are left with hopes they may not have expressed but can never realise, they become the yardsticks with which they judge the system. To avoid complaint, yardsticks should be agreed in advance.
- ● Convey a sense of excellence — like any service function, DP cannot avoid having an image. It owes it to itself to project the right one to build user confidence. An image of sober, assured, realistic competence is very necessary — with a touch of excellence.

I'll say more about some of these in later articles.

48 Aids to better communication

Annual report to users
Application simulation
Assignments
Attitude scaling
Audio-visual programmes
Booklets
Clear writing training
Computer assisted instruction
Courses
Direct personal contact
DP information officer
Ergonomics studies
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Newsletters
Notices
Open days
Personal computing advisors
Personal computing control board
Reference cards
Reputation profiles
Seminars
Service reports
Sociometric testing
Steering groups
Suggestion schemes
System documentation
Understanding surveys
Usage reports
User briefings
User guides
User support groups
Wallcharts
Working parties

Figure 1: Many techniques are established. The management challenge lies in selecting the optimum mix for a given situation.

Managing user communication

1 DEFINE KEY RESULT AREAS. Which systems . . . applications . . . user problems . . . users are most critical? For the organisation? For future user relations?
2 SET OBJECTIVES. What must the users know . . . expect . . . understand . . . accept . . . be able to do as a result of our communication?
3 AUDIT THE FACTS. What are the current levels of user satisfaction, expectation and knowledge? Are they satisfactory? Is current communication really needed? Could it be improved? What extra communication is required? Which techniques are most effective in *this* organisation? What will help users most to get full benefit from computing? Are the communication objectives sound?
4 PLAN A STRATEGY. Validate communication objectives. Define user communication policies. Select communication approaches, systems, channels and techniques to meet objectives in the light of resources, facilities and user needs.
5 CARRY IT THROUGH. Establish the systems and channels. Develop the skills. Stage events. Produce publications, aids and reports. Track results against objectives.

Figure 2: Managing communication is the way to cut a major problem down to size.

GUIDELINES

Achieving good user communication is a constant task. It makes major demands — on management time, effort and skills, not least because every case is unique. Some general guidelines have, however, been established.

1. Cut the problem down to size. Manage the problem and tackle it in stages. Define the key result areas. Settle on the objectives. Get the facts about how things stand now. Draw up a strategy, then tackle the issues, realistically, one by one.

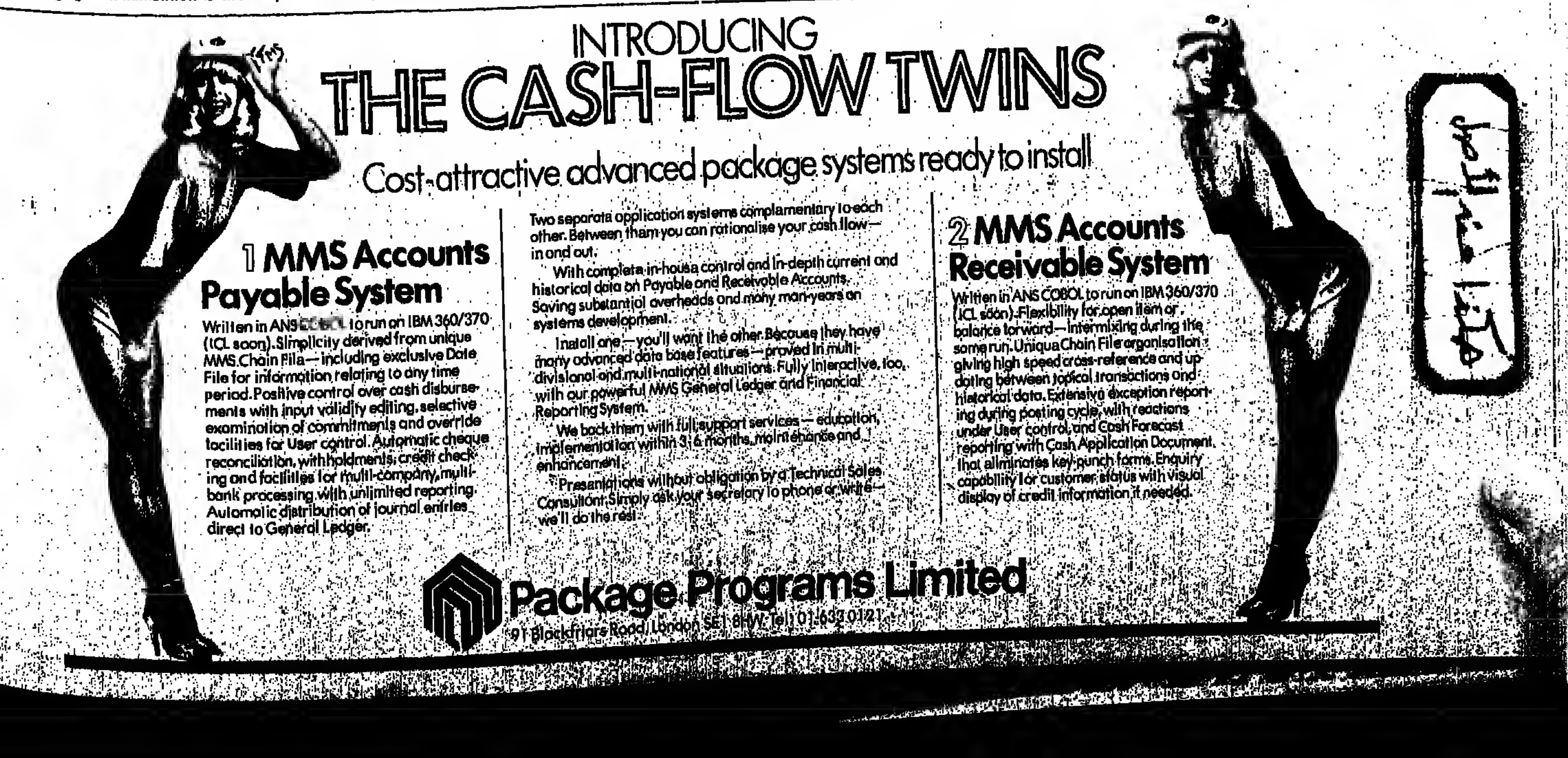
2. Manage towards objectives. Often, communication tends to look after itself. Systems do get documented. Users receive their reports. Newsletters are issued. Steering committees continue to meet. But too often the return on the effort escapes review.

More mileage can be got from the same effort if clear objectives are set for each item and event. A common complaint often is that a committee, newsletter or report has outlived its purpose. With clear objectives the value of every communication can be checked against the time and effort it soaks up.

3. Manage from base facts. Whatever the objectives of end user communication they must be achievable. To ensure this, facts about the audience are vital.

Even if problems are not evident, a communication system, like any human system, needs regular checking and maintenance.

Today's communication research techniques are subtle but powerful management aids, when applied with skill. The day when major DP functions put the techniques to work is perhaps not so very far away.



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The computerised tomography scanner, which uses a computer to reconstruct a cross-section of the human body scanned by X-ray, was developed at EMI. Research began on the brain scanner in 1967, and the first system was installed at Atkinson Morley's Hospital, London, in 1971.

Since then the whole-body scanner has been introduced and more than 600 EMI systems have been installed in hospitals all over the world. The honours heaped upon its inventor, Dr Godfrey Hounsfield, include the coveted UK MacRobert Award and America's top scientific honour, the Lasker Award. A Queen's Award to Industry for technological achievement was followed by three in as many years for export achievement. Exports of the EMIscanner, since marketing began in 1972, have now reached almost £160 million.

In this article, NANCY POCOCK explains how the system works.

A patient is positioned in the computerised scanner.

'Greatest advance in clinical radiology since the discovery of X-rays'

LIKE conventional radiography, CT, computerised tomography, scanning is used mainly in diagnosis, but scanner pictures present two major advantages over standard X-ray pictures: the elimination of unnecessary information, and the extreme precision of the information obtained.

A standard X-ray photograph contains three-dimensional information represented in a two-dimentional medium. Unwanted information, though blurred out, is still present and reduces the clarity of the picture. The CT scan produces an image which is genuinely two-dimensional, a cross-section, and which contains no superfluous information.

An X-ray beam contains far more information than can be represented visually at one time, either on a photographic medium or on a video unit.

For example, the human eye can recognise up to 20 shades of grey on a VDU, whereas the scanner can reproduce up to 2,000 X-ray absorption levels. Such precise information can only be represented with complete accuracy on a computer print-out, with each point appearing as a numerical value.

The scanner system is able to make use of the detailed information available to it through the technique of VDU windowing. A range of absorption levels is selected and the available shades of grey are distributed over the range, so that at any one time certain details are highlighted and others faded out. For example a scan of a chest slice can "focus" on either the ribs and vertebrae, or the lungs, or the air spaces within the lungs. The "focus" can be changed by the window level control, and the extent of the range of absorption levels is determined by the window width control.

The value of this sensitivity lies in the fact that although the absorption values of the materials occurring in the human body cover a wide range, those of most interest to the diagnostician fall within narrow limits.

EMI's scale of absorption values shows dense bone at one end, with a value of +500, and air at the other, —500, but tissue ranging from +14 to +30 and congealed blood from +30 to +40.

The method uses an X-ray source and a detector which are rotated round a section of the patient's body so that a series of intensity readings can be taken through the section. From the readings a reconstruction of the section is made.

The patient's body lies between the X-ray source on one side, and on the other 32 detectors, which move around it (the figures given in this and the following paragraph apply to the general-purpose whole-body scanner, but the method is the same in all EMIscanners). In this way the rate of X-ray absorption of the materials through which the ray has passed can be calculated.

The scanner makes a straight traverse across the whole of the scan section, taking readings as it goes. At the end of the traverse it revolves through an angle of 10° and begins another traverse. In all, 18 traverses are made and a total of 324,000 readings taken.

The thickness of the slice of tissue scanned is determined by the width of the X-ray beam. However, the slice may in fact be treated as a two-dimensional matrix, each measured point of which actually represents the average density of a cube of tissue.

The fact that a number of readings are taken for each picture point, from different angles, is an essential feature of the method. Each individual reading is a measurement of the amount of radiation absorbed along a straight line through the body of the patient. If the scanner merely took readings at points on the circumference of a semi-circle around the patient's body, no point would be covered more than once, and it would be impossible to distinguish between a single point with a high absorption level and a large area with a relatively lower level.

The scan reading data passes through amplifiers and analogue-to-digital converters and into the core storage of a 32K Data General Eclipse minicomputer, where it is pre-processed to correct for such things as variations in the X-ray and in the speed of the system. (The larger scanner systems incorporate two Eclipses.)

It is then stored on the main system disc, and in core a picture is reconstructed from it on a 320×320 or 160×160 matrix (the latter giving higher density precision and lower spatial resolution).

Pictures can be displayed from the disc on to the operator's display console. They can then be transferred, either selectively or automatically, to the magnetic tape which serves as an archive for scanner output.

They can also be output to a diagnostic viewing console, a floppy disc unit, a line printer or a photographic system (eg, a multi-imager camera which produces pictures on X-ray film, or a bromide paper camera).

A survey conducted by EMI (CW, September 1) has shown that, ultimately, the use of a scanner can enable sizeable cuts to be made in hospital costs, both by rendering other tests and often exploratory operations unnecessary, and by reducing the time a patient spends in hospital.

The Royal Marsden Hospital, at Sutton, in Surrey, has an EMIscanner which has been up and running since July of this year. Since it is one of the two most important cancer research hospitals in the country, the Cancer Research Campaign financed the purchase of its scanner; but the hospital has to find the running costs, estimated at about £100,000 a year.

By far the greatest part of these costs is represented by the salaries of the full-time staff required; one qualified radiologist to interpret the findings, one technician and one secretary, and a minimum of two radiographers to work the machine one shift a day, and four or more if more than one shift is to be worked and the machine fully utilised.

Maintenance and supplies (mag tapes, etc) also figure on the list. Then there is the question of finding somewhere to put the ensemble of machine and staff — at the Royal Marsden a new building was necessary.

At research hospitals like the Royal Marsden the cost savings from the new machine will be less apparent, but the more detailed information made available by it is greatly appreciated.

"Even in these very early days, we are seeing things we have not been able to see before," says Dr Jim Macdonald, consultant radiologist. "And sometimes being able to define exactly what is there can make the difference between mere palliation, and cure."

Diagnosis is not the only use to which the scanner data can be put. The Royal Marsden is experimenting with it in connection with treatment planning, a computerised technique developed at the hospital which uses a PDP-8 to plot an optimum path for X-rays destined to intersect and thus give maximum irradiation at the site of a cancer.

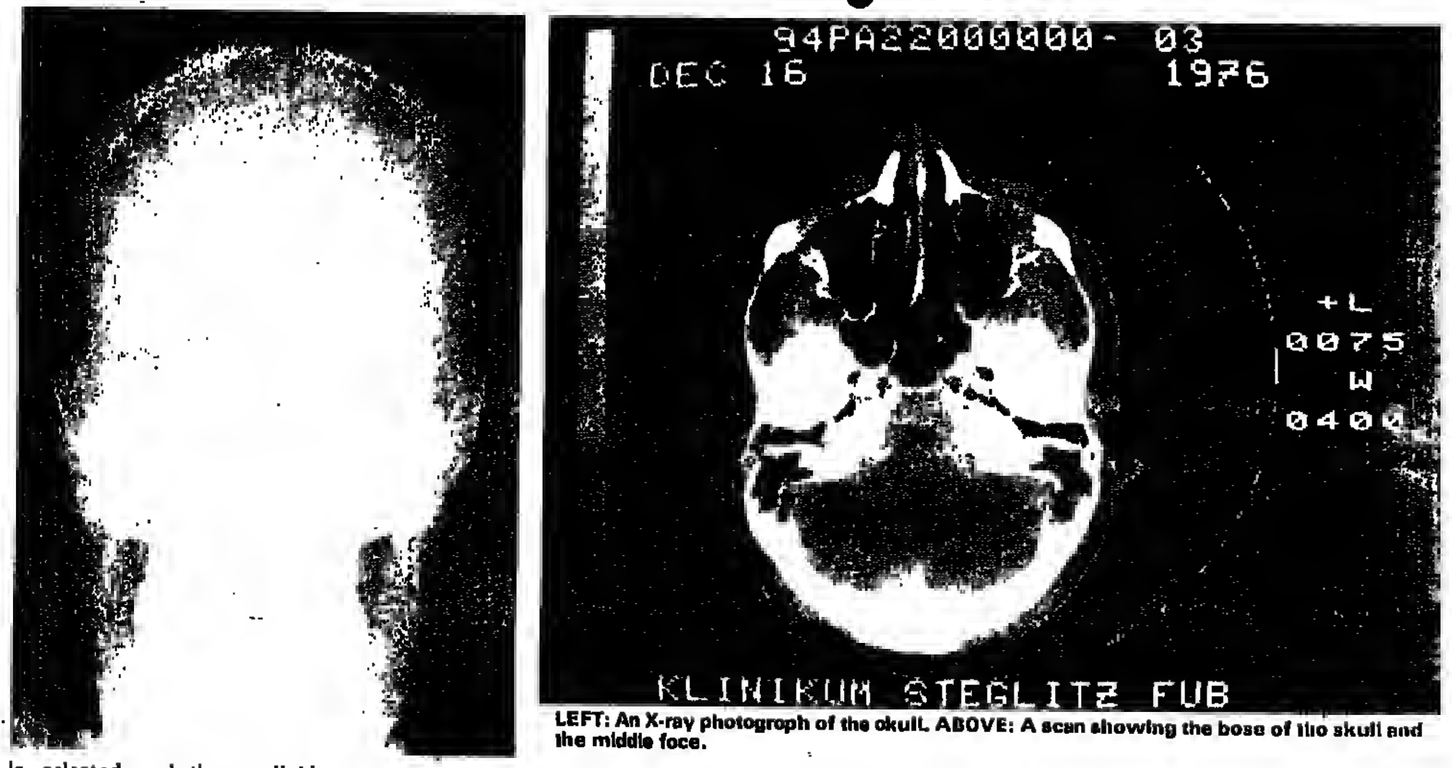
Scanner output is particularly suitable for use with this system, since aside from the wealth of detail it provides, the data is already in numerically coded form on magnetic tape.

EMI still leads in the body-scanning field, although many other companies are now marketing their own scanners.

The area in which improvement is needed is that of scan time, and to date any method used to better EMI's time of 18 seconds would seem to cause a reduction in quality of information. This is because reducing scan time involves reducing the number of angles from which readings are taken, and with fewer readings a less accurate picture is obtained.

Whether EMI will maintain its lead remains to be seen. Other manufacturers, led by Ohio Nuclear, are winning a share of the market, but the large amount of documented evidence which has by now accumulated for the success of the EMIscanner still gives the British company the advantage.

And the credit for "the greatest advance in clinical radiology since Röntgen discovered X-rays" belongs to Hounsfield, who invented the scanner and developed it at EMI, which helped [illegible]



LEFT: An X-ray photograph of the skull. ABOVE: A scan showing the base of the skull and the middle face.

Industry appeal

Those wishing to contribute to the appeal to the computer industry which aims to raise the cost of the computing element of the Royal Marsden's EMIscanner should contact the Cancer Research Campaign at 2, Carlton House Terrace, London SW17, or the appeal organiser, David Ayers, at Tritech Computer Services, 01-948 4213/4.

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Computer Weekly

Computers have been applied to non-numerical problems for almost as long as computers themselves have existed. It was in 1946 when A. D. Booth first suggested that they could be used for the translation of language. During the past few years the need for machine translation has certainly increased. There has been an information explosion and it was estimated that 4,00,000 journal articles, 120,000 technical books, and 100,000 technical reports were published in 1975 — about 60,000,000 pages — and output doubles every ten years. Here JOAN SMITH, of Manchester University, reports on how the European Economic Community is tackling the problems of the language barrier, and on the work of Professor Shiu-Chang Loh, head of the Department of Computer Science at the Chinese University of Hong Kong, in machine translation from Chinese to English.

Professor Shiu-Chang Loh

How the Chinese are tackling translation

"OVERCOMING the Language Barrier" was the theme of an EEC information systems and networks conference in Luxembourg earlier this year, and a three-year-plan is to be implemented under which experiments are to be made in machine translation. The European intention is to build up databanks of terminology, constructing multi-lingual thesauri, and to produce rough translations of technical documents, continually refining the techniques.

One of those who delivered a paper at the EEC conference was Professor Shiu-Chong Loh, head of the Department of Computer Science at the Chinese University of Hong Kong, and leader of the machine translation group at the university.

He was also invited by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the Inter-Government Co-ordinating Committee (IGCC) to conduct a feasibility study on a machine translation system to be used in one of the countries in that region. He is well qualified, for he has proved that the machine translation of mathematical articles from Chinese to English can be carried out to an "acceptable" standard — acceptable, that is, to readers at various libraries throughout the world which subscribe to the English version of *Acta Mathematica Sinica*, a journal published by the Chinese Academy of Science in Peking.

The Chinese University Language Translator (CULT) project at Hong Kong was initiated in 1969. It was recognised at the outset that fully automatic high quality translation was not feasible. By contrast with other groups, the method they chose to adopt was not that of post-editing the target text, as had been done previously, but pre-editing the source text.

They are of the opinion that by pre-editing, the semantic and lexical analysis will be much simpler and more effective. In theory, if the source language can be pre-edited to make it as compatible as possible with the structure of the target language, and a set of rules is programmed for analysis and synthesis, then the translated texts obtained will be readable and accurate.

Preparation of the Chinese texts for translation involves the breaking up of complex sentences into those with a simpler structure. Sentences in Chinese may lack verbs or subjects, and these are inserted to facilitate analysis and translation. Verbs, where they exist, have only one form, so the correct English equivalent has to be indicated. Articles must be added. In all, 18 different syntactic and semantic indicators may be used in the pre-editing.

Mathematicians may not be grammarians but it is generally thought that they often have the ability to be able to express themselves clearly and concisely. In mathematics the same phrases occur again and again, reflecting the ordered nature of the work, and easing the translation procedure.

One result of the Cultural Revolution, however, is that not all the authors of published papers have undergone a rigorous training in "classical" methods, and their modes of expression can be much freer and very different from those of their more orthodox colleagues; these idiosyncrasies present added difficulties at the translation stage.

The meaning conveyed in the original must be preserved in the translation; significant patterns in the source language must be identified precisely and have corresponding patterns in the target language. A machine dictionary, now containing about 30,000 items, is used for the translation of patterns occurring in source text to the equivalent ones in the target language. Each "headword" consists of one or more Chinese characters which can be a word or a phrase. An entry comprises the source codes where each character of the "headword" is represented by the standard 4-digit Chinese telegraph code, function codes which provide information for grammatical analysis of the source item and selection of the target codes, and the target codes themselves giving a single meaning for the source item, but listing all the inflected forms of the English equivalent.

Source language analysis and target language synthesis are then carried out. The function target codes are assembled for each sentence and the parsing is done in three stages.

First, the relationship of the items is determined to establish the various parts of speech. An analysis is carried out classifying the items according to grammatical categories; items are rearranged to form a pattern of an English sentence, the relative order being dependent on the function of the phrases and clauses. Finally, the target codes for the sentence are determined, based on the parts of speech of the items and their grammatical categories.

In dealing with the principal item, the routine also considers some of its important properties which will then be used to translate those in other categories. Once a complete syntactical analysis has been done, the translated text is output on the line printer. Any missing items (e.g. mathematical formulae) are then inserted.

The routines are written in Standard Fortran and currently run on an ICL 1904A; transfer to other machines has been a major design criterion. The average speed of translation is about 60 words per CPU second, and the whole process of translating 120 pages of Chinese to English takes just 10 days.

Input/output of the text remains one of the problems, particularly for Chinese characters. This is one of the areas which Professor Loh is currently investigating.

Many problems encountered in this field are dependent on further research in computational linguistics. More sophisticated models have to be designed than those which exist today. As far as machine translation itself is concerned, the EEC plans may result in a revival of interest in Europe.

New World net links 60 UK Citibank outlets

UNDERLINING the potential threat posed by minicomputers to the traditional medium-scale mainframe market, Citibank Financial Trust is replacing its IBM 370/135 with two Data General Nova 3D minis. The twin aims are to enable the bank to expand its UK business and to save money on its computing facilities.

The project, called New World, involves the installation of specially-designed microprocessor-based display and printer terminals at Citibank Financial Trust's 60 UK outlets (CW, September 29).

The terminals come from Megadata, a Long Island, New York company whose products are marketed in much of the world by Cable and Wireless, the British Government's communication services and systems company.

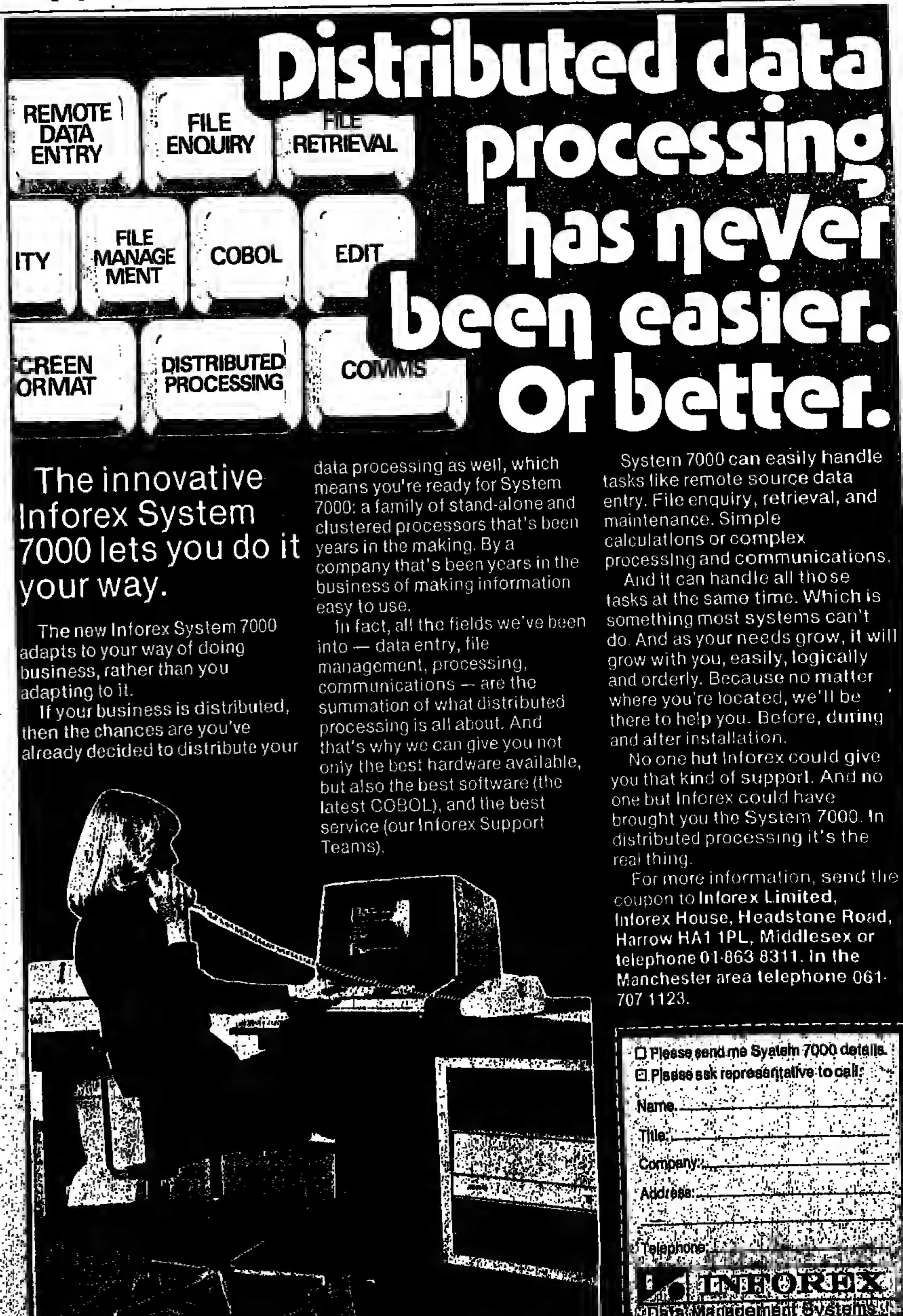
The terminals will communicate with the Novas via three concentrators from Infotron, of Pennsauken, New Jersey, and the communications network is being designed by a small New York City systems house, DP Communications Corp.

At the centre of the system will be the two Novas, each with 96K-words of main memory and three 92 Megabyte disc drives. Much of the special software for the system is being written by Data Logic of London. The minis are being programmed in assembler and Fortran, but Cobol will also be used in the second phase of the project for report generation programs.

"We are putting in the system because we want to expand our business in the UK," a spokesman for the bank told Computer Weekly. "With the batch system running on the '135, errors don't show up until one to three days after they happen, and that is not adequate."

Citibank's Project Paradise, the overall philosophy under which the bank is rapidly replacing its large base of mainframes with multiple minicomputers, involves each unit of the bank making its own decisions about the computing system it wants. As a result, although Citibank Financial Trust has operations akin to the UK operations in France, Germany, Belgium and Italy, each will decide in isolation on its future requirements.

"They may consider adopting our system, or parts of it," the spokesman commented, "but it would only be after they have specified their requirements."



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CSA 'Code of Practice' for recruitment companies

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The guidelines for the code of practice are given in full here:

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THE RECRUITMENT COMPANY MUST NOT:

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2. Denigrate an offer which a candidate has received from another source.

3. Without the express permission of the candidate's current employer, approach with a view to offering alternative employment opportunities, a candidate it has placed.

4. Offer alternative employment to a candidate known, within the last 12 months, to have started or accepted a new job, obtained from another source.

5. Send the candidate's details to a client without first informing the candidate of the name and address of the client UNLESS:

the candidate has given unambiguous consent for his details to be sent to any possible employer considered suitable by the recruitment company, such consent to indicate whether the candidate's name should be included in the details sent.

6. Knowingly put forward candidate for a job which unsuitable.

7. Knowingly give incomplete or misleading information to a candidate in order to influence the candidate's decision about a job offer.

THE RECRUITMENT COMPANY MUST:

8. Acknowledge the receipt of all candidates' applications.

9. Inform candidates of the progress of their applications and notify them as soon as a decision has been made.

10. Inform candidates, in advance of interviews with the company or the client, what expenses will be reimbursed and by whom.

11. Provide interviewing facilities which allow interviews to be held without being overheard.

12. Treat as confidential all information about a candidate and not release it or any part of it to third parties, other than clients.

B. CLIENTS

THE RECRUITMENT COMPANY MUST NOT:

1. Without the express permission of the candidate's current employer, approach with a view to offering alternative employment opportunities, a candidate it has placed.

2. Knowingly give misleading or incomplete information about a candidate in order to affect a client's decision.

3. Offer an alternative job to a candidate who has replied to an advertisement paid by a client before that client has expressly rejected the candidate's application, or the candidate has rejected the job.

THE RECRUITMENT COMPANY MUST:

4. Before incurring any expenses, inform the client in writing of its terms of business and in particular its terms in relation to replacement fees, advertising costs and expenses.

5. Offer a client only candidates who, as far as it can reasonably ascertain, have relevant experience for the job.

6. Offer to a client only candidates who are interested in the job offered or, where the candidate is put forward without prior discussion, the company believes in good faith, the candidate would be interested.

7. Tell the client whether or not the candidate has been interviewed.

8. Treat as confidential all information about a client and not release it or any part of it to third parties other than to candidates.

9. Not allow the relationship between its placement fees and candidates' salaries to influence its judgment when advising clients on salary levels.

10. Ensure that candidates are reimbursed only their reasonable expenses by the client.

C. STAFF

THE RECRUITMENT COMPANY MUST:

1. Provide reasonable working conditions for its staff.

2. Provide reasonable training for its staff.

3. Ensure that its staff understand and observe the CSA Code of Conduct, this Code of Practice and all relevant legislation; in particular the Employment Agencies Act 1973.

D. ADVERTISING

THE RECRUITMENT COMPANY MUST NOT:

1. Offer candidates any financial inducement, or inducement in kind, to reply to an advertisement, to attend an interview or to accept a job offer.

2. Use any misleading information in any advertisement.

3. Advertise a job which does not exist.

4. Advertise a job without the express permission of the client offering that job.

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Univac 90/60 Operators
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Sheer success is the reason behind the recent re-organisation and expansion in our client's DP department. And that re-organisation could mean real success for the DP people who can develop and extend the already wide range of commercial applications which this manufacturing company uses. Hardware is an IBM 370 operating under DOS, with extensive use of teleprocessing. Our client now needs the following staff:-

Project Leader
up to £6750
Systems Analysts
up to £5950

To work in admin systems such as sales support and stock control. The ideal background is a formal systems training, although experience alone will still carry a lot of weight. The Project Leader will ideally be a graduate, and the Analyst should ideally have an O & M background, and at least one major IBM-based project to his or her credit.

Senior Programmers
up to £5750

To lead small programming teams in the development of database and other programmes for production control and admin systems. Our Client is looking for around four years' programming on IBM 370 machines, using PL1 (and perhaps Assembler) with ideally DBOMP.
Ref. JP/0029 **London**

IBM 370/125 Operators
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Cosmetics company with a worldwide reputation and an IBM/125 under DOS/VS and POWER needs two young, bright operators to work a four-shift, 38-hour week. Real prospects for promotion to Shift Leader.
Ref. AM/0042 **London**

Senior Analyst/Programmer
c. £4300 + low-cost mortgage
Leicester

A lot of people stand to benefit from our Client's life assurance and related activities - not least the Senior Analyst/Programmer the Company now needs to work in COBOL on a Honeywell H200, soon changing to a series 6/66. If you're in your early to mid 20s with 3-5 years' commercial COBOL experience, this is a chance to find real project involvement while working in a pleasant city centre environment.
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Telecomms Technicians
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As one of the UK's biggest, busiest computer bureaus, our Client makes extensive use of data transmission between several data centres. At two of these centres - in Birmingham and on the South-West fringes of London - the Company now needs technicians with at least 18 months' data transmission experience who are perhaps working as line controllers in a small bureau, and now want to move into something bigger. Birmingham salary is up to £4600, London up to £5000 - both with car and a top-level benefits package.
Ref. B/059 **Birmingham**

Analyst/Programmer
COBOL Programmer
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The COBOL Programmer will need 2-3 years' COBOL experience; the Analyst/Programmer should have a commercial background. Ref. B/125 **Birmingham**

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Location: South London
Income: In the range £8,000 to £10,000 per annum
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Based in South London, they now wish to recruit a Data Processing Manager to take charge of an already established Data Processing Department, and to take this department into 'the 1980s'. The initial tasks will be to ensure, a) that the department keeps running on a daily productive basis, and b) that thorough investigations are made into the development of new computer facilities within a two-year framework. These facilities could cover either a new Mainframe, a large Mini or a Computer Service Bureau.

Consequently, the person we are looking for will know his or her way round current computer technology. He or she will already have had a responsible position in computing, probably in Systems or Programming, and will be able to prove from past experience that he or she can control people and produce realistic recommendations to non-computer management with regard to hardware and systems development.
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You will be able to give practical assistance to customers in areas like industry applications, database and communications.

Based at Holborn, Hammersmith, Croydon or Colchester, your salary will be above £5,000 but negotiable according to experience for top applicants. A company car or a car allowance is also offered.

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Honeywell Information Systems Ltd
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invites applications for appointment as

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in the Computer Centre which has an ICL 1903T computer with EDS 60 backing store operating under GEORGE 2 and MAXIMOP.

The person appointed should have a working knowledge of FORTRAN and ALGOL 60, preferably in an ICL environment.

The job includes assisting users in an advisory capacity, package and general software development.

Salary will be on the scale £2904-£4811 (under review).

Further information and application form can be obtained from:

The Secretary (Appointments)
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quoting reference S72/B
(closing date for applications 11 November 1977)

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Applications are invited for the post of

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The post will involve programming in COBOL for both new systems and the maintenance of existing systems. At present the University Administration operates a Honeywell (GE) 415, 32K tape/disc system, which provides both batch and interactive processing capability.

This appointment is particularly suited to a young person with graduate or other qualifications in Computer Science or with some experience of programming in a high level language. The successful applicant will have the opportunity to work with an established team of experienced personnel utilising a wide variety of modern equipment and techniques.

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IBM 370/125	18 mths. DOS/VS CICS	Days only	N.W.10	£3350 +
IBM 370/125	1 yr. + DOS/POWER/VS	4 shifts	Essex	£3400 +
IBM 370/135	2 yrs. DOS/VS POWER/VS	3 shifts	Sussex	£3500
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CSA 'Code of Practice' for recruitment companies

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12. Treat as confidential all information about a candidate and not release it or any part of it to third parties other than clients.

B. CLIENTS

THE RECRUITMENT COMPANY MUST NOT:

1. Without the express permission of the candidate's current employer, approach with a view to offering alternative employment opportunities, a candidate it has placed.

2. Knowingly give misleading or incomplete information about a candidate in order to affect a client's decision.

3. Offer an alternative job to a candidate who has replied to an advertisement paid by a client before that client has expressly rejected the candidate's application, or the candidate has rejected the job.

THE RECRUITMENT COMPANY MUST:

4. Before incurring any expenses, inform the client in writing of its terms of business and in particular its terms in relation to replacement fees, advertising costs and expenses

5. Offer a client only candidates who, as far as it can reasonably ascertain, have relevant experience for the job.

6. Offer to a client only candidates who are interested in the job offered or, where the candidate is put forward without prior discussion, the company believes in good faith, the candidate would be interested.

7. Tell the client whether or not the candidate has been interviewed.

8. Treat as confidential all information about a client and not release it or any part of it to third parties other than to candidates.

9. Not allow the relationship between its placement fees and candidates' salaries to influence its judgment when advising clients on salary levels.

10. Ensure that candidates are reimbursed only *their reasonable expenses* by the client.

C. STAFF

THE RECRUITMENT COMPANY MUST:

1. Provide reasonable working conditions for its staff.

2. Provide reasonable training for its staff.

3. Ensure that its staff understand and observe the CSA Code of Conduct, this Code of Practice and all relevant legislation; in particular the Employment Agencies Act 1973.

D. ADVERTISING

THE RECRUITMENT COMPANY MUST NOT:

1. Offer candidates any financial inducement, or inducement in kind, to reply to an advertisement, to attend an interview or to accept a job offer.

2. Use any misleading information in any advertisement.

3. Advertise a job which does not exist.

4. Advertise a job without the express permission of the client offering that job.

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SALES EXECUTIVE
Basic c. £6,000 + comm.

Fabulous opportunity to leap ahead by joining major US Group marketing a much sought after Mini Computer (over 5,000 systems installed in 1976). Your market will consist mainly of OEM users where you can derive maximum sales from bulk buying thereby yielding an income in excess of £10,000 p.a. You will need to be confident and ambitious with sales experience and living in London or Home Counties. Start basic around £6,000 + Ghia Cortina Car. Call Jeff, 581019.

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Knight Contracts

Could you use 500 operators?

That's the number of operators we've got on our books at the moment. When you consider that we won't take anyone with less than 2½ years' experience, that's quite a team. So even if we picked you a team of Knight operators at random, you'd be sure of top calibre people. But we don't pick at random. Whether the job is for tomorrow or next month, regular or emergency, we make sure that every operator we send you has the right background for your type of hardware.

Sue Smyth, June Mogg and Jane Asbury will pick the operators you need. Call them now on 01-491 4706.

Programmers Immediate Contracts

RPGII Various locations – all machines.- Ventek Datashare programmer for London.

IBM – COBOL/BAL/PL1/RPGII/CICS.
ICL – 1900/2900 – COBOL.
FORTRAN – PDP/IBM/Data General.

This is just a selection from our current list. We have many contracts in all areas, so if you have at least 4 years' programming experience, phone Richard Kaluzynski or Sue Gillam on 01-491 4706 to find the one that's right for you.

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Univac 90/60 Operators
£3569 City

Successful, stable oil company subsidiary with expanding computer department needs two operators, preferably with Univac experience, to work a two- or three-shift week. Free lunches, good working conditions, and the prospect of promotion to Senior Operator.
Ref. AM/0040 **London**

New jobs, new opportunities in East London

Sheer success is the reason behind the recent re-organisation and expansion in our client's DP department. And that re-organisation could mean real success for the DP people who can develop and extend the already wide range of commercial applications which this manufacturing company uses. Hardware is an IBM 370 operating under DOS, with extensive use of teleprocessing. Our client now needs the following staff:-

Project Leader
up to £6750

Systems Analysts
up to £5950

To work in admin systems such as sales support and stock control. The ideal background is a formal systems training, although experience alone will still carry a lot of weight. The Project Leader will ideally be a graduate, and the Analyst should ideally have an O&M background, and at least one major IBM-based project to his or her credit.

Senior Programmers
up to £5750

To lead small programming teams in the development of database and other programmes for production control and admin systems. Our Client is looking for around four years' programming on IBM 370 machines, using PL1 (and perhaps Assembler) with ideally DBOMP.
Ref. JP/0029 **London**

IBM 370/125 Operators
£3733 Essex

Cosmetics company with a worldwide reputation and an IBM/125 under DOS/VS and POWER needs two young, bright operators to work a four-shift, 38-hour week. Real prospects for promotion to Shift Leader.
Ref. AM/0042 **London**

Senior Analyst/Programmer
c.£4300 + low-cost mortgage Leicester

A lot of people stand to benefit from our Client's life assurance and related activities – not least the Senior Analyst/Programmer the Company now needs to work in COBOL on a Honeywell H200, soon changing to a series 6/66. If you're in your early to mid 20s with 3–5 years' commercial COBOL experience, this is a chance to find real project involvement while working in a pleasant city centre environment.
Ref. B/057 **Birmingham**

Telecomms Technicians
£4600-£5000 plus car Birmingham and London

As one of the UK's biggest, busiest computer bureaus, our Client makes extensive use of data transmission between several data centres. At two of these centres – in Birmingham and on the South-West fringes of London – the Company now needs technicians with at least 18 months' data transmission experience who are perhaps working as line controllers in a small bureau, and now want to move into something bigger. Birmingham salary is up to £4600, London up to £5000 – both with car and a top-level benefits package.
Ref. B/059 **Birmingham**

Analyst/Programmer COBOL Programmer
£3600-£5000 Birmingham

The main attraction of these jobs – with a bureau whose principal customer is a large freight organisation – is the opportunity to build wide-ranging programming experience in a short space of time.
The COBOL Programmer will need 2–3 years' COBOL experience; the Analyst/Programmer should have a commercial background. Ref. B/125 **Birmingham**

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Salary required ....
Position required: Permanent ☐ Contract ☐ CW20

Data Processing Manager

Location: South London
Income: In the range £8,000 to £10,000 per annum
Plus company car

Our client, one of the best-known public companies in the United Kingdom, has a range of products that are household names in the business world.

Based in South London, they now wish to recruit a Data Processing Manager to take charge of an already established Data Processing Department, and to take this department into 'the 1980s'. The initial tasks will be to ensure, a) that the department keeps running on a daily productive basis, and b) that thorough investigations are made into the development of new computer facilities within a two-year framework. These facilities could cover either a new Mainframe, a large Mini or a Computer Service Bureau.

Consequently, the person we are looking for will know his or her way round current computer technology. He or she will already have had a responsible position in computing, probably in Systems or Programming, and will be able to prove from past experience that he or she can control people and produce realistic recommendations to non-computer management with regard to hardware and systems development.

The position is not an easy one, and we are looking for someone with dynamism and confidence to greatly improve the performance of our client's installation. However, if this latter is achieved the rewards will be significant.

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You will be able to give practical assistance to customers in areas like industry applications, database and communications.

Based at Holborn, Hammersmith, Croydon or Colchester, your salary will be above £6,000 but negotiable according to experience for top applicants. A company car or a car allowance is also offered.

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Honeywell

Cranfield Institute of Technology
invites applications for appointment as

Programmer

in the Computer Centre which has an ICL 1903T computer with EDS 60 backing store operating under GEORGE 2 and MAXIMOP.

The person appointed should have a working knowledge of FORTRAN and ALGOL 68, preferably in an ICL environment.

The job includes assisting users in an advisory capacity, package and general software development.

Salary will be on the scale £2904-£4811 (under review).

Further information and application form can be obtained from:

The Secretary (Appointments)
Cranfield Institute of Technology
Cranfield, Bedford, MK48 0AL
quoting reference 672/B
(closing date for applications 11 November 1977)

UNIVERSITY OF STRATHCLYDE
Applications are invited for the post of

COMPUTER PROGRAMMER

In the MANAGEMENT SYSTEMS DIVISION of the University Administration.

The post will involve programming in COBOL for both new systems and the maintenance of existing systems. At present the University Administration operates a Honeywell (GE) 415, 32K tape/disc system, which provides both batch and interactive processing capability.

This appointment is particularly suited to a young person with graduate or other qualifications in Computer Science or with some experience of programming in a high level language. The successful applicant will have the opportunity to work with an established team of experienced personnel utilising a wide variety of modern equipment and techniques.

Salary scale £2,904 – £3,627 per annum on Grade IA of National Salary Structure for University Administrative Staff. USS benefits. Placing on scale according to qualifications and experience.

Application forms and further particulars (quoting 30/77) may be obtained from the Academic Appointments Officer, University of Strathclyde, Royal College Building, 204 George Street, Glasgow G1 1XW, with whom applications should be lodged by [illegible]

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IBM 360/40	1 year + Jun. Op.	2 shifts	S.W.6	£2200+
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IBM 360/40/50	2 yrs. DOS	3 shifts	Surrey	£3300
IBM 370/125	18 mths. DOS/VS CICS	Days only	N.W.10	£3350+
IBM 370/125	1 yr. + DOS/POWER/VS	4 shifts	Essex	£3400+
IBM 370/135	2 yrs. DOS/VS POWER/VS	3 shifts	Sussex	£3500
IBM 370	Shift Ldr. DOS/POWER/CICS	2 shifts	E.C.3	£3900
IBM 370/125	3 yrs. DOS or DOS/VS	3 shifts	Surrey	£4300

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ICL System 4	Trainees	3 shifts	N.W.10	£2000+
ICL 1901T	1 yr. + GII	3 shifts	Crawley	£2500++
ICL 1903T	1 yr. GII/DII+	3 shifts	Middlesex	£2800
ICL 1900	1 yr. GII +	3 shifts	N.W.1	£3000
ICL 1902A	18 mths. GII	3 shifts	W.1	£3000
ICL 2903	2 yrs. experience	2 shifts	N.W.9	£3500
ICL 1900	18 mths +	3 shifts	Berks	£Good
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UNIVAC	18 mths. experience	4 shifts	W.2	£3000
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If you are unable to attend our "open house", telephone Mike Wilson or Charles Petey who will be pleased to give you any information you require. You can also write a letter enclosing a c.v. to:

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Experience of the 370 mainframe using COBOL is preferred, with other language knowledge an advantage. You should have an innovative approach to problems, good communication and be capable of working with the minimum supervision.
The salary will be negotiated according to depth of experience, with a career-minded man or woman keenly aware of the true function of EDP.
The working conditions and benefits are first class – modern air-conditioned offices, stylish restaurant (offering 3-course lunches below 50p), 23 days' holidays, plus 11 days public and other holidays, annual season ticket loan after 3 months service, Pension Scheme, Sports Social Club facilities etc.
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Duncan Ross,
Recruitment & Development Officer,
The Electricity Council,
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CITY **c. £4500**

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To ensure the smooth day-to-day running of the operations department the successful applicant will be required to schedule all production work and test-shots with a view to obtaining the utmost efficiency from a small multi-programming machine. Supervisory capability will prove beneficial since the person appointed will be responsible for a team of operators, data-control clerks, and punch operators.
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Applicants for this senior position should ideally have a background in both systems and operations and possess a thorough knowledge of I.B.M. OS, J.C.L. and utility programmes. Actual computer room experience together with the ability to write programmes in assembler language and COBOL would be added advantages.
Chrysler can offer you:-
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Applications are invited for a post of Senior Research Assistant in Computer Science, tenable for a period of three years from January 1, 1978. The person appointed will be required to carry out research into on-line multi-access information systems as part of a collaborative programme with the UK Atomic Energy Authority at Harwell. Applicants should have a first or second class honours degree in mathematics, computer science or related discipline and a sound training in computer programming. Experience of on-line information systems, modern data base techniques, interrogation languages or parallel processing methods would be an advantage.

The salary will be on a scale up to £4,190 per annum plus USS/USOPS benefits.

Further particulars and application forms (2 copies) may be obtained from the Personnel Officer, University College of Swansea, Singleton Park, Swansea, SA2 8PP, to whom they should be returned by Friday, November 11, 1977.

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Progs — Mini, Commercial, Assembler and On-Line 18 months + exp. — Ferranti Argus 700, experience of Coral, 2 years + exp. — Fortran for commercial applications. – PDP11/70 + RSX 1M + Fortran IV, ideally Cobol and Real Time.

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PROGRAMMERS

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£2822-£3702 + £312 + 5% (max. £208) supplements

Required at the City of Birmingham Polytechnic Computer Centre at Perry Barr. Applicants should have at least two year's experience on ICL 1900 range, and a good working knowledge of GEORGE 2 and/or MAXIMOP.

Candidates, male/female may obtain application forms (returnable by October 27th) from:

The Personnel Officer
City of Birmingham Polytechnic
F Block, Perry Barr
Birmingham B42 2SU
Tel. 021-356 6911, Ext. 217

Management Services

Our Management Services Department works on a wide range of computer systems assignments operating within multi-disciplinary project teams. Each team is totally responsible for the project from its initial user investigations through to computer systems specification and final implementation.
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QUADRANT RECRUITMENT

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S. MANCHESTER £5,000 - £5,750

Our client, an engineering company in the South Manchester area, runs an IBM 370/115 under DOS/VS with both financial and production applications.

A programming supervisor is required to take responsibility for all aspects of the work of a small programming section and is also expected to work closely with systems analysts on future project development.

Applicants must have an in-depth knowledge of COBOL and whilst some experience of database and on-line techniques would be preferred, it is not essential.

The successful applicant, who will report to the data processing manager, will be offered a starting salary in line with his/her experience, and attractive relocation package.

Initial interviews can be held in Manchester, Sheffield or London.

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datec

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Computer Operations

We are a successful and well established remote access and timesharing bureau, with a large country wide network, and an overseas operation. We require Operators and Data Controllers at various levels to work with advanced equipment in our modern computer operations centre in Epsom.

We offer appropriate training and advancement to shift leader grades for those who possess the relevant experience, are willing to accept increased responsibility and have the urge to progress through the Company.

We offer the employee benefits associated with a leading professional organisation including staff bar and restaurant and sports and social club facilities.

Interested? Then write giving brief personal and career details to Mike Warren, Senior Personnel Officer, Atkins Computing Services Limited, Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW or telephone Epsom 26140, extension 2444.

Atkins Computing

Programming Manager

N.W. London

Salary Negotiable

The company is a market leader in its specialised engineering field with excellent growth prospects and an extremely impressive export record. Diversification across the market area and abroad, coupled with technical innovation, has led to several Queen's Awards to Industry.
In DP, both hardware and software are being significantly enhanced with a larger IBM 370 system, CICS, DL/1 and both in-house and remote terminals.

Technical strengths and ability alone are not sufficient; the position requires a good man manager. Previous management or at least team leading or supervisory experience is required. The person appointed will be expected to be capable of formulating and implementing policy for the programming area including the investigation of new programming techniques and the definition of standards. Naturally a high level of technical expertise is also expected; the use of COBOL in a DOS/VS environment, familiarity with CICS/VS and DL/1 and preferably ability with other languages such as ASSEMBLER and PL/1.

The company offers an excellent basic salary, a bonus scheme, company pension scheme and other fringe benefits associated with a major organisation. There is a large car park and excellent public transport facilities. For further details write or telephone our CROYDON office quoting ref: CW59-7J.

Computing Services Association

01-686 9693 (24 HOUR ANSAPHONE) | 061 236 2419 FAULKNER HOUSE,
19 PARK STREET, CROYDON, CR9 1TN | FAULKNER STREET, MANCHESTER M1 4YD

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER

CITY ARCHITECT'S DEPARTMENT

PROJECT CONTROLLER

£4992 - £5577 + £312 + 5% (max. £208) supplements

Responsible for programming, man-power resourcing and cost control on all projects being undertaken by the Department and in addition, to continue the computerisation programme in these areas.

Applicants should be qualified Computer Programmers and fully conversant with the ICL 1900 computer package and preferably have some experience of Computer Aided Design.

Candidates, male/female, may obtain application forms (returnable by 4th November 1977) and job descriptions from:-

City Architect, City Architect's Department,
Baskerville House, Civic Centre,
Broad Street, Birmingham B1 2NE.
Tel: 021-235 4492/3247

Please quote Ref. 4/844

Canvassing of members of the City Council will disqualify.

BIRMINGHAM
CITY COUNCIL

Warwickshire County Council

MIDLAND ROAD CONSTRUCTION UNIT HEADQUARTERS

Programmer

SO 1/2 (£4,236 - £4,962) plus Supplementary Allowances — Post No 27

Assistant Programmer

AP 4/5 (£3,385 - £4,086) plus Supplementary Allowances — Post No 40

Applications are invited for the above vacancies at the Headquarters of the Midland Roads Construction Unit in Leamington Spa. The Unit is responsible for Motorway and Trunk Road projects for 8 Midland Counties and the successful applicants will join a team working on interesting applications in the field of highway engineering.

Systems analysis would form a vital part of the work and applicants should possess an appropriate qualification and have good experience of I.B.M. 360/370 machines under O.S. and should be fluent in Fortran. Experience in P.L./1 an Assembler would be an advantage. The persons appointed should also have experience in highway design by computer but candidates with experience in other disciplines will be considered.

The appointment will be on the permanent staff of the Warwickshire County Council and will be subject to the National Conditions of Service, the Local Government Superannuation Acts and the production of a satisfactory Medical Certificate. The persons appointed will be on permanent secondment to the Department of Transport.

Application forms can be obtained from the Director, Midland Road Construction Unit, Brendon House, 52-54 Holly Walk, Leamington Spa to whom they should be returned by not later than Friday the 4th November, 1977.

Duncan Bransom Recruitment

DATA PROCESSING MANAGER - £7.500

2 Years Cobol Programming ☑
3 Years Successful Systems Analysis and Design ☑
Installed at least One System from Start to Finish ☑
Ready to Run Your Own Small Department ☑
Familiar with OS and RJE ☑
Capable of Learning the Ins and Outs of any Mini-Computer in Under Two Weeks ☑
Prepared to Work Hard and Meet Production Deadlines ☑
Pleasant and Likeable Person with Plenty of Drive ☑
Prepared to Accept the Responsibility for All Data Processing Activities for a Large Company ☑

At **HERTZ UK LTD** the Hertz operating company in the United Kingdom and part of the giant RCA corporation, there may be an opening for you as their new Data Processing Manager if you can put a tick against each of these questions.

The Data Processing Manager will be responsible for the design and operation of all systems for **HERTZ UK LTD** and will be located at Norbury, London, SW16. There will be regular contact with the European Headquarters at Hertz Europe Ltd. Future promotion and career development could include a transfer to European Headquarters.

Please write or telephone for an *application form to:*
Roger Griffiths, Duncan Bransom Ltd.,
37, Hillcrest Road, Loughton, Essex
Telephone 01-508 5121

Duncan Bransom Limited

SOUTH LONDON—CROYDON AREA

DO YOU FEEL YOU WOULD LIKE A POSITION OF RESPONSIBILITY IN A SMALL TEAM WHERE YOUR CONTRIBUTION REALLY COUNTS? READ ON

Our clients are looking to employ experienced Analyst/Programmers and a further Operator to augment their existing team. They are committed to a heavy reliance on data processing facilities and are currently involved in developing a sophisticated integrated accounting system. Further systems development plans are too numerous to list, it is suffice to say the environment is dynamic and developing, where your potential and capability will be stretched to its full.

RPG II ANALYST/PROGRAMMERS SALARY TO £5,500 P.A.

Candidates should have:—

- ★ a fluency in RPG II and a minimum of 12 months' programming experience, in a commercial environment
- ★ the ability to liaise with top members of management
- ★ a pleasing personality and the desire to work with the minimum of supervision.

Company benefits again are "many-fold" to include a pension scheme, free luncheon vouchers, four weeks' holiday a year plus statutory allowance, and concessional travel.

INTERESTED?

PHONE: CATHY TRACEY

OPERATOR (OPERATIONS SUPERVISOR DESIGNATE) SALARY £4,000 P.A.

Applicants should have:—

- ★ a minimum of 12 months' operating experience
- ★ preferably experience on IBM System 3 equipment
- ★ flexible attitude.

REF. NO. CW/10/9

01-935 0671

SCR

SPECIALIST COMPUTER RECRUITMENT LTD.
BIRMINGHAM 021-236 3781 FREEPOST
Freepost, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR
MANCHESTER 061-833 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 3BD
LONDON 01-935 0671 FREEPOST 6
Freepost 6, 102 Blandford Street, London W1E 1JZ

Computing Services Association

JBA

Consultant

London **circa £9,000**

A consultant is required to join a busy team primarily engaged on city assignments. Candidates will have a sound d.p. background with particular emphasis on financial applications, say, Banking, Insurance and Stockbroking. Additionally, the key function will be client liasion, therefore applicants must be personable and have the ability to communicate effectively with senior management. This is an excellent opportunity to work for a reputable consultancy organisation and to make a significant contribution to the company's growth. A substantial starting salary will be paid to attract high calibre candidates.

Contact: Margaret Stevens

Systems Analysts

Kent/Essex **up to £5,950**

Our client, a well known manufacturing company, offer exceptional systems development work and progression into project leader positions. Ideally, candidates should have a background in production control, sales administration, stock control, or accounting. Consideration will be given to relatively junior analysts and senior programmers wishing to make the move into analysis.

Interesting, varied work at excellent salaries.

Contact: Mike Creamer

Junior Systems Analysts

Central London **circa £5,000**

A large retail organisation now requires additonal development staff in their merchandising section. Candidates must have had some formal training in analysis and at least two years programming experience, ideally in COBOL. Programmers wishing to progress into analysis are invited to apply as trainees. IBM experience is particularly desirable but not essential.

Convenient location, excellent salaries, great prospects.

Contact: Mike Creamer

Process Control

London & N.W. **up to £6,500**

Our client, a well established name in the process control and automation industry, has opportunities for engineers with a software background to join their development teams.

Candidates must have several years experience in programming preferably in FORTRAN, CORAL, RTL/2 or ASSEMBLER and be able to demonstrate a sound background of industrial control systems.

Salaries and fringe benefits are above average with the opportunity for advancement and travel.

Contact: Jim Baker

Analyst/Programmers

West of London **neg. circa £6,000**

Applications are invited from those who can make an immediate contribution in a demanding technical role. Essentially your d.p. experience should have covered a broad spectrum of commercial or manufacturing applications, and a thorough knowledge of an Assembler level language. Specialist skills, such as real-time development on minicomputers will be highly valued. You will be working on possibly the most advanced manufacturing control system outside the U.S.A.

The client is looking for well educated people, with out-going personalities, who have the ability to document clearly and to work well under pressure. These positions offer a varied and challenging working environment and the opportunity for the ambitious programmer to join a small but highly professional team.

Contact Margaret Stevens

Programmers

Surrey **c. £4,000**

A large international finance organisation has vacancies for Programmers to work on sophisticated real-time and teleprocessing systems.

Applicants must have at least six months experience of a high level language, such as COBOL, PL/1 or BASIC, in a commercial environment. An extensive training programme is available.

Salaries negotiable according to experience. Excellent fringe benefits.

Contact: Jim Baker

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES
International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Real Time Computing in The Health Service

At the North Staffs Hospital Centre we have vacancies in the exciting area of hospital management systems.

We employ an I.C.L. based computer network with over 100 terminals in real time running 24 hours a day. Many of the applications are pioneering and employ innovative real time techniques.

We require the following staff:

SENIOR SYSTEMS ANALYST

Scale 14 £4536 – £5613 + £312 + 5% (maximum £208) supplements.

SYSTEMS ANALYST

Starting scale 4 (£3534 – £4344) with prospect of promotion up to £4983 + £312 + 5% (maximum £208) supplements.

Both posts require at least 5 years in-depth programming and systems experience. The Senior Analyst will be capable of leading multi-disciplinary teams in successful implementation. Much of his/her work will consist of user liaison.

PROGRAMMER/TRAINEE PROGRAMMER

Programmers start at £2691 to £3534 + supplements. *Trainees* start at £2181 to £2691 + *supplements*. Future advancement, commanding salaries up to £4983 will depend on ability and experience gained.

The successful programmer will be working in an advanced multi-processor real time environment, using I.C.L. and Data General equipment, with both high and low level languages where our professional approach ensures the highest standards.

For further particulars and/or an application form please apply to the Director of Computing Service, North Staffordshire Royal Infirmary, Princes Road, Hartshill, Stoke-on-Trent ST4 7JN. Telephone Stoke-on-Trent 49144 ext. 4540.

North Staffordshire Health District.
Staffordshire Area Health Authority

BRISTOL
SOUTH WEST SOUTH WALES

Bristol

Project Leader (ICL) £6.K	Analyst Prog (PL1 + CICS) £4.5K
Analyst Prog (Support) £6.K	Analyst Prog (BAL Cobol) £4K
Analyst (ICL) £5.1K	Programmer (ICL) £4.5K
Analyst (ICL) £4.5K	Programmer (Various) £3-4K
Analyst (IBM) £4.5K	Operators (IBM + ICL) £3.5K

South West WILTS & GLOUS)

Analysts (ICL) £5.5K	Programmers (ICL) £5K
Analysts (ICL) £5K.	Programmer (ICL) £4.5K
Analysts (Support) £4K + CAR	Programmer (Various) £4K
Analysts Prog (Cobol) £4.2K	Operator (ICL) £3.5K

South Wales

Analysts (Support) £4K + CAR	Programmer (Support) £3.5K + CAR
Analysts Prog (RPGII) £3.5K	Programmer (Various) £NEG

STOP PRESS (South Coast)

Analyst (IBM) £5K	Programmer (DEC/Coral) £NEG
Prog (OS/Cobol) £5K	

SANDERSON EXECUTIVE
9a Princess Victoria St., CLIFTON, BRISTOL 8
TEL. 0272 39302

Carlsberg

OPERATIONS CONTROLLER

We are looking for an Operations Controller with some systems analysis experience to assist in the day-to-day running of a small ICL 2903 installation.

It will be necessary as part of the duties to operate the computer and Direct Data Entry equipment.

The successful applicant will be aged 25 to 30 and have several years' experience of OCL techniques.

Please apply in writing to: **Personnel Department, Carlsberg Brewery Limited, P.O. Box 46, 140 Bridge Street, Northampton NN1 1PZ.**

SYSTEMS DESIGNERS LIMITED

ADVANCED COMPUTING SYSTEMS

PROGRAMMERS AND SYSTEMS ENGINEERS UP TO £6,500

Systems Designers Limited is a leading, and expanding, British systems consultancy specialising in mini and micro computer applications.

Growing demand for our high quality service has created a full order book, with exciting opportunities for top programmers and systems engineers. Current projects are challenging and rewarding, while rapid progress is possible for top people. Company policy of full participation and involvement of all members has resulted in a dynamic environment and wide career challenge.

Head office is in Frimley, Surrey, and we have a nearby centre for producing turnkey systems. We are a private company, with substantial financial backing. Excellent benefits and working conditions include profit sharing, optional BUPA and pension scheme, and a lively Sports and Social Club. Assistance is given with removals where necessary. Opportunities will occur for those interested in working in Europe.

REAL-TIME SYSTEMS

Important Government and industrial projects have created challenging opportunities for people skilled in the design and implementation of real-time mini and micro computer systems.

Requirements exist in all areas including communications systems, advanced military systems and industrial process control.

We are interested in hearing from programmers and systems engineers at all levels. Applicants must have at least one year's experience, good academic qualifications and proven software ability, together with a professional outlook.

ADVANCED SOFTWARE

We are deeply involved in compiler technology, real-time language specification, and research into multi-microprocessor trends. We are keen to meet software specialists with sound experience in these areas who can contribute to our reputation and capability.

Please write to or telephone Bill Hockey, Systems Manager, at Systems House, 57-61 High Street, Frimley, Surry GU16 5HJ. Telephone: Camberley (0276) 63471.

SALES EXECUTIVES TIMESHARING SERVICES AND INFORMATION SCIENCES

HOLLAND (Amsterdam)	Circa D.Fl 73,000
GERMANY (Frankfurt and Munich)	Circa D.M. 69,000
BELGIUM (Brussels and Antwerp)	Circa B.Fr 1 Million
U.K. (London)	Circa £10,000

(SPLIT 70% BASIC, 30% COMMISSION PLUS COMPANY CAR)

Our Clients are the World's largest independent firm in Information sciences and continue to grow at a phenomenal rate. They now employ over 8,400 personnel worldwide and had a turnover in excess of $234 Million in their last financial year.

Services offered by the company include systems programming, application programs, requirements analysis and systems design, facilities management, communications systems, systems engineering, software products, educational services, government and industrial systems and information network services.

We have been asked to identify suitable candidates to fill a number of vacancies for salesmen in Europe and the U.K. They will be selling the company's timesharing services, primarily for financial applications and as such, should have a good knowledge of the timesharing market-place in their particular country. Applicants should preferably be nationals and total fluency in the country's language is essential.

These are exciting and rewarding opportunities to join one of the fastest growing companies in the computer industry today. An excellent future is assured for any salesman who can show the ability to achieve targets and develop new accounts.

Interested applicants should telephone the Advising Consultant and interviews will be arranged in the relevant countries towards the end of October.

Reference CW 310/1

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

01-353 6187 (Office Hours)
01-353 1436, (Ansafone Service)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

TIMESHARING — COMPUTER BUREAU BRANCH MANAGERS

FARNBOROUGH, HANTS
FAREHAM, HANTS
SHEFFIELD, YORKS
INCOME c £8,500 PLUS CAR

Our Clients are one of Europe's leading timesharing bureaux with more than a dozen offices throughout the U.K. where they currently employ some 250 people and have a turnover in excess of £3M p.a. They are committed to increasing their commercial systems business and are looking for three senior people to join their organisation and assume total revenue responsibility for new and existing business and for sales and support staff within their branches.

Candidates are likely to have the following qualifications:

- ★ A positive front-end sales background, ideally within the timesharing industry.
- ★ A proven successful sales track record within this or a directly comparable environment.
- ★ Capable of identifying new business areas, particularly within a commercial environment.
- ★ Preferred age group 28-35.

CUSTOMER CONSULTANTS BRISTOL AVON

income c £5,500 plus car

In addition, they are looking for suitable candidates to fill important field customer support roles in the West Country. Candidates will probably have the following background:

- ★ Programming or systems background in the timesharing industry.
- ★ Able to communicate with customers in a sales environment.
- ★ Preferred age group 25-35.

Customer consultants report directly to the branch managers and branch managers in turn to the regional manager. Branch managers will have responsibility for both sales and support personnel within their branches in addition to a direct field sales role. Career progression for successful candidates will be directly related to perfomance.

Applicants interested in these excellent opportunities should telephone the Advising Consultant quoting the appropriate reference number.

Reference CW 310/2

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

01-353 6187 (Office Hours)
01-353 1436, (Ansafone Service)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

PROGRAMMERS

LONDON AND HOME COUNTIES

Salaries to £5,500

REAL-TIME MINIS **ON-LINE MAINFRAME**

Interesting opportunities exist for programmers with either COBOL or commercial ASSEMBLER level language experience who can demonstrate a high degree of self-motivation, user acceptance and proven or potential supervisory ability.

The likely candidate profile is as follows:

- ★ At least eighteen months' relevant programming experience.
- ★ A strong commercial awareness.
- ★ A Degree or equivalent preferred.
- ★ The ability to communicate effectively.
- ★ The ability to accept responsibility quickly.
- ★ Ambitious.

Candidates who feel they match the above specification are invited to contact the Advising Consultant to arrange immediate interviews. Please quote the relevant reference number:

Reference CW310/3

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

01-353 6187 (Office Hours)
01-353 1436 (Ansafone Service)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

FIELD SERVICE ENGINEERS

Salary to £4,500 plus allowances plus car

LONDON AND HOME COUNTIES

Our Clients are one of the world's leading manufacturers of computers including technically advanced stand-alone computers, mini-computers and teleprocessing systems. Due to continued expansion within the U.K., they are looking to recruit dynamic engineers responsible for maintaining equipment within London and the Home Counties.

The preferred candidate profile is as follows:

- ★ Proven experience in servicing computer systems.
- ★ The ability and desire to work autonomously.
- ★ Probably an HNC in Electronics or equivalent.

While these features are important, we believe that there is no substitute for practical experience.

Applicants must be confident in their own abilities and mere "board-swoppers" need not apply.

Please contact the Advising Consultant quoting the appropriate reference number for further information regarding these excellent opportunities.

Reference CW310/4

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

01-353 6187 (Office Hours)
01-353 1436 (Ansafone Service)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

TWO OUT OF SIX?

☐ PDP11
☐ CORAL
☐ MACRO
☐ SYSTEMS/ SOFTWARE ENGINEER
☐ TRAFFIC/ SYSTEMS EXPERIENCE
☐ TELE-COMMUNICATIONS

If you can tick two (or more) of the boxes because you have relevant experience our client would want to talk to you. And, equally important, you would want to talk to him.

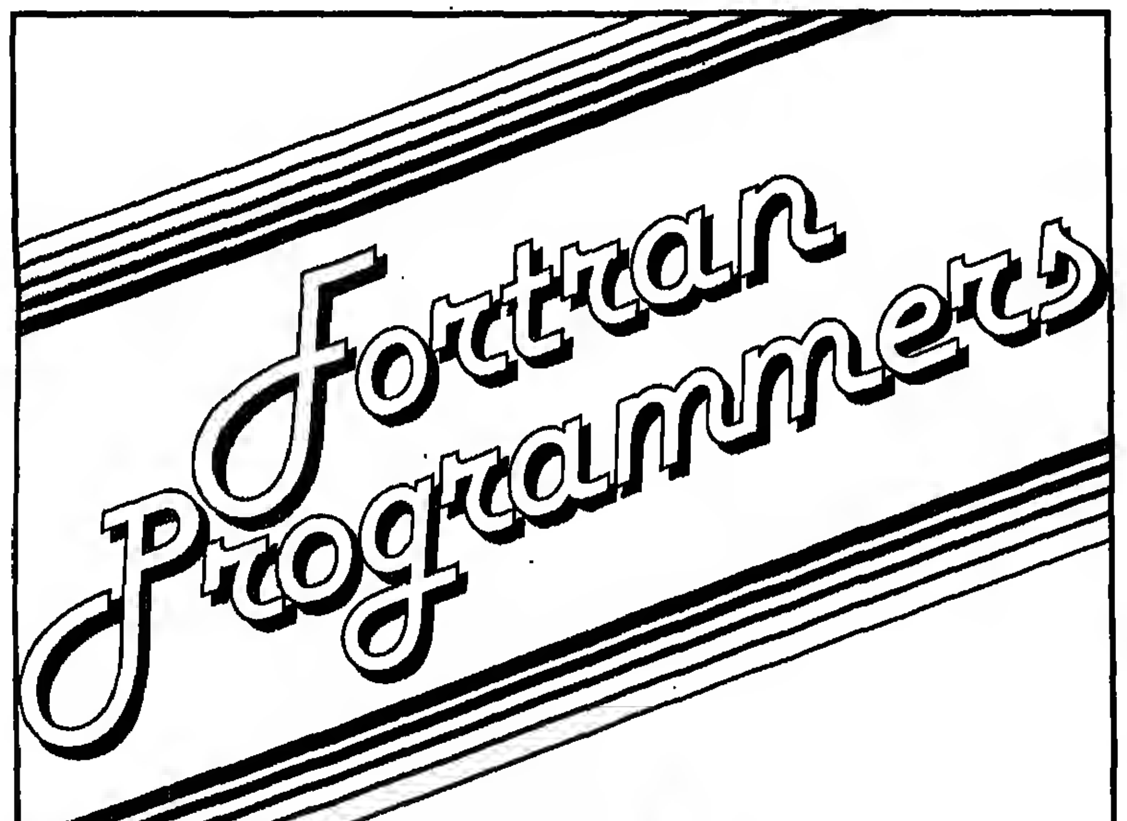
His need is for real-time systems & software engineers who are interested in working on advanced technology projects for the U.K. and export markets.

You would be interested in this field of work, are looking for a salary of between £3,500 to £5,500 p.a. now, want to join a company which can offer a variety of work and provide good working conditions in a particularly pleasant area. Further, you would like to talk to someone who won't keep you hanging about for weeks.

For a brief chat now please ring John Nolan at Richard Owen *Advertising on 01-638 1891*

Richard Owen Advertising

Cross Keys House, 56 Moorgate, London EC2R 6EL



speak to our Sperry Univac 1100 in Bracknell

Our Design Automation section has vacancies for programmers with a minimum of two years experience.

Applicants should have an engineering background and want to develop their careers further into the field of design automation, or have already worked in one or more of the following areas:

- * **Electronic Circuit Design**
- * **Electronic Circuit Analysis**
- * **Thermal Analysis**
- * **Printed Circuit Board Layout**
- * **Numerical Control**

Future plans for the section include the development of inter-active systems using mini-computers to front end the Sperry Univac 1100/11.

Experience of this machine would be an advantage, but training will be given where appropriate.

Competitive salaries will be in line with ability and experience and Sperry offers the usual large company benefits.

Write to or telephone Stephanie Wasnidge, Personnel Officer, Sperry Gyroscope, Downshire Way, Bracknell, Berks RG12 1QL. Tel: Bracknell (0344) 3222. Quote Ref C/201077.

SPERRY
GYROSCOPE

WEST LONDON

1900 SOFTWARE SUPPORT SPECIALIST

SALARY to £6,500 PER ANNUM PLUS MAJOR COMPANY BENEFITS

Opportunity for a Software Specialist to join a Company, having an international reputation that is unsurpassed in their field.

The successful candidate will have some four years experience in programming 1900 PLAN. Practical knowledge of George II and Communication Manager is also desirable.

A Real Time Invoicing System is due to go live and further development of on-line systems is planned. Major upgrading of hardware capability is scheduled for 1978.

He/She will join a team of five, enhancing and maintaining the Operating System, evaluating system performance, developing communications software and providing technical advice to application teams.

The Company staff enjoy a very pleasant working environment and staff relations, together with attractive fringe benefits including subsidised restaurant.

PLEASE TELEPHONE WITHOUT DELAY OR SEND A CAREER RESUME TO THE ADDRESS SHOWN.

Ref. CW918

DPSC

Crown House, Morden, London SM4 5EU
recruitment division
01-540 8311
24-hour answering service

HOWARD

BELGIUM c. £15,000 p.a.

We are seeking

PROGRAMMERS

In the following major area.

1. **HARDWARE TEST SUPPORT** to aid the preparation of software proving a mini computer system. The tests will be written in a real time variant of PL.1. Programme production will be undertaken on an IBM 370/168 configuration under OS/MVS using TSO. Some mini experience in a real time environment would be helpful as would a knowledge of ASSEMBLER. (Ref. DCO/41077A)

2. **INTEGRATION TEST PREPARATION** (mini based). General knowledge of mini applications in a real time environment (ideally familiar with C11/C1MSA) able to debug at machine level on a teletype. Programs written in a real time variant of PL.1.
Experience of working under pressure is essential. We require practical individuals with the ability to apply fixes and to get a Computing systems up and running with minimum delay. (Ref DCO/41077B).

3. **INTEGRATION TEST PREPARATION** (on host IBM mainframe) required up to date IBM JCL experience preferably on a 370/168 with MVS running TSO. A knowledge of PL1 *together* with some experience of mini computers would be desirable. (Ref. DCO/41077C).

4. **SOFTWARE SUPPORT** to aid in preparation of software (written in mini ASSEMBLER) to input *data from special peripherals* — familiarity with a mini computer ASSEMBLER language in a real time environment is essential. Some exposure to FORTRAN and IBM JCL is desirable. (Ref: DCO/11077D).

HOLLAND c. £12,000 + p.a.

SYSTEMS ANALYST

age 30+ should have several years' real-time process/plant control and STRONG PROGRAMMING background using PDP11's, RSX11M and FORTRAN experience required, PDP assembler and asset, (Ref. BJ9977)

FRANCE c. £9,500 p.a.

TECHNICAL AUTHORS

(PARIS)

A number of authors are required for a major publications development project. A strong background in DP is essential for these positions and knowledge of the following subjects would be particularly relevant.

—*Data base management*
—JCL
—Communications Software
—Interactive and RJE systems
—*Programming languages* COBOL, FORTRAN or RPG2

(Ref. DECO/01087)

FRANCE £9,000 p.a.

PROGRAMMER

Mini computer programmer with knowledge of photo typesetting and use of intelligent terminals required for project in Paris. (Ref. DCO/25077)

Apply in first instance to *G. Ryan (01-953 4066)*
Overseas Recruitment Consultant, Employment Business Section,
Howard Organisation International Limited,
Manor Way, Borehamwood, Herts

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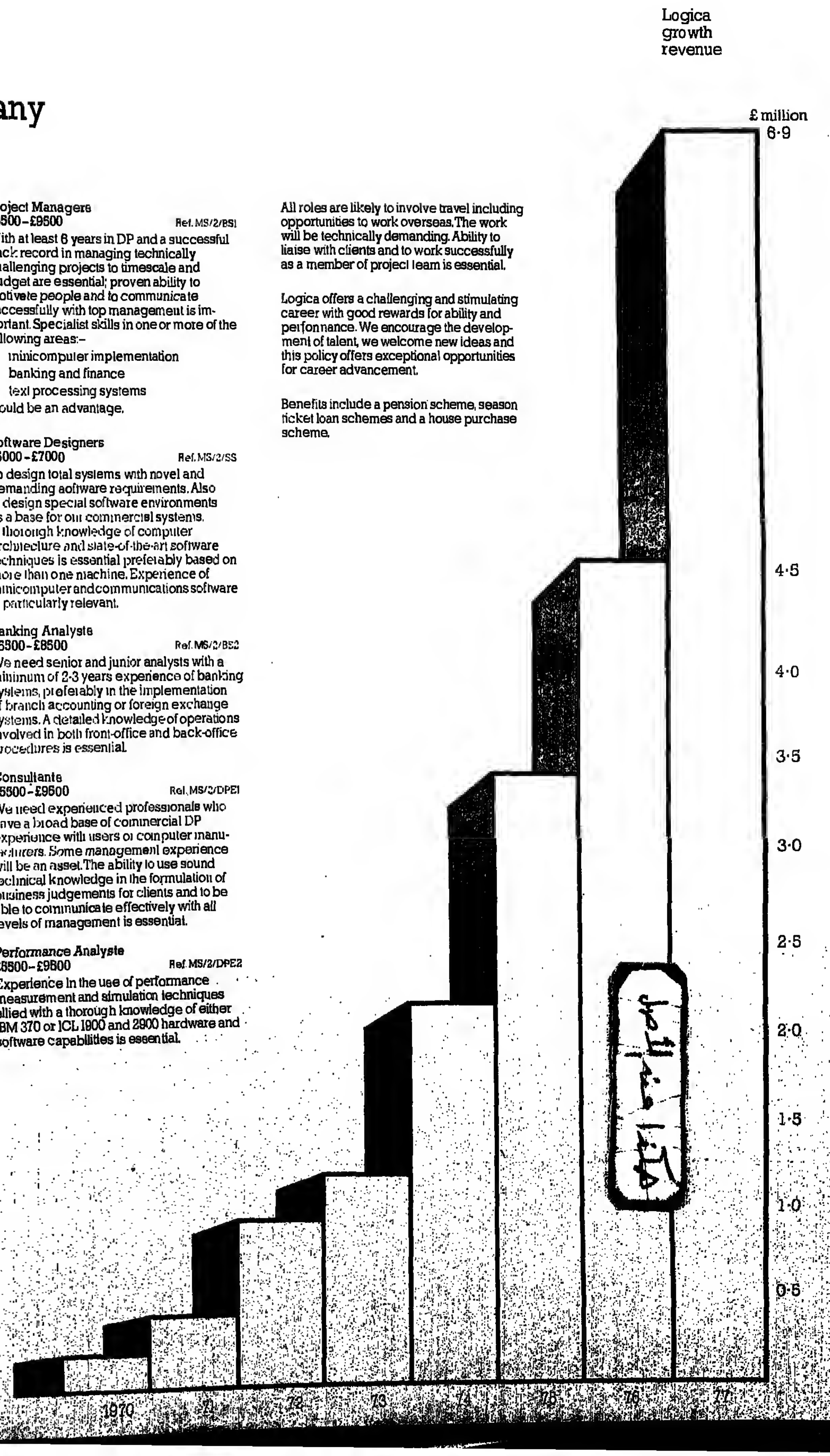
logica

The Growth Company



It is through continuing growth that new and expanding career opportunities are created. With particular emphasis overseas, many new openings have been created in Logica's Management Systems Group. We confidently expect to increase both the number of clients and the geographical spread. Our clients in the United States, New Zealand, Norway, Libya, Singapore and Finland include some of the world's largest and most successful banks, companies and organisations. They rely on Logica's services because of our international reputation in:–

Turnkey implementation of commercial systems

Many of our projects are based on mini-computers, and our reputation is particularly high in the development of banking systems. At the heart of many of these projects is our TRADER foreign exchange product.

Development of systems software

The diversity of projects covers:–

- the production of total systems with novel graphics and communications content
- creation of high-performance software environments to support reliable transaction-based systems
- supply of language compilers and low level software for mini, micro and mainframe equipment

Consultancy to top management on future computer policies

We specialise in:–

- computer performance management, based on the use of hardware and software measurements and advanced simulation techniques.
- requirements analysis and system selection.
- planning the exploitation of distributed processing techniques.

Our considerable success means that we urgently need experienced people who feel they can contribute to these exciting opportunities. We want professionals with initiative who will welcome responsibility and some opportunity for overseas assignments.

Call Margaret Neagle, the Group Personnel Officer, on 01-637 9111 to discuss these opportunities with Management Systems Group managers or send your career summary, using Freepost and quoting the reference appropriate to your area of interest to:

Logica Limited
Freepost
PO Box 4SE
64 Newman Street
London W1A 4SE

Project Managers
£6500–£9500 Ref. MS/2/BS1

With at least 6 years in DP and a successful track record in managing technically challenging projects to timescale and budget are essential; proven ability to motivate people and to communicate successfully with top management is important. Specialist skills in one or more of the following areas:–

- minicomputer implementation
- banking and finance
- text processing systems

would be an advantage.

Software Designers
£5000–£7000 Ref. MS/2/SS

To design total systems with novel and demanding software requirements. Also to design special software environments as a base for our commercial systems. A thorough knowledge of computer architecture and state-of-the-art software techniques is essential preferably based on more than one machine. Experience of minicomputer and communications software is particularly relevant.

Banking Analysts
£5500–£8500 Ref. MS/2/BS2

We need senior and junior analysts with a minimum of 2-3 years experience of banking systems, preferably in the implementation of branch accounting or foreign exchange systems. A detailed knowledge of operations involved in both front-office and back-office procedures is essential.

Consultants
£5500–£9500 Ref. MS/2/DPE1

We need experienced professionals who have a broad base of commercial DP experience with users or computer manu*facturers. Some management* experience will be an asset. The ability to use sound technical knowledge in the formulation of business judgements for clients and to be able to communicate effectively with all levels of management is essential.

Performance Analysts
£5500–£9500 Ref. MS/2/DPE2

Experience in the use of performance measurement and simulation techniques allied with a thorough knowledge of either IBM 370 or ICL 1900 and 2900 hardware and software capabilities is essential.

All roles are likely to involve travel including opportunities to work overseas. The work will be technically demanding. Ability to liaise with clients and to work successfully as a member of project team is essential.

Logica offers a challenging and stimulating career with good rewards for ability and performance. We encourage the development of talent, we welcome new ideas and this policy offers exceptional opportunities for career advancement.

Benefits include a pension scheme, season ticket loan schemes and a house purchase scheme.

SOUTH BIRMINGHAM

PROGRAMMER/ANALYSTS

SALARY c£4,400 P.A.

We have been retained by our clients, a large distribution concern, to recruit experienced PROGRAMMERS who have a sound knowledge of SYSTEMS within a commercial environment. The successful candidate will work as part of a small, friendly team and be housed in a modern, award winning building.

Successful applicants should:—

- ★ be fluent in COBOL, preferably but not essentially Honeywell
- ★ have a minimum of two years' commercial programming experience, ideally with some systems experience
- ★ be of mature personality.

Normal large company benefits apply including discounts on all products and heavily subsidised meal facilities.

Interested candidates should contact without delay:—

ANDREW CARTER 021-236 3781 REF. NO. CW/10/10

SOFTWARE SALES

Northern Home Counties & London

to: 8K + CAR + super benefits

Our Client is a privately owned Company which supports and sells an integrated series of products. These products enjoy acceptance in many major main-frame installations, and are generally regarded as being the most complete and best supported in their particular application areas.

THE COMPANY IS GROWING DRAMATICALLY, AND THIS IS A NEW SALES TERRITORY. THE POSITION WILL APPEAL TO A SYSTEMS/ENGINEER TYPE OF PERSON WHO IS SEEKING A DIRECT SALES ROLE.

Candidates must have:

- ★ a sound technical background from within a main-frame environment, with ideally, a knowledge of 370 or 1900 hardware
- ★ if not sound direct sales experience within a data processing environment, then the correct personal motivation, presence and attitude to succeed in such a job.

This is an unusual opportunity to move into direct sales from a technically biased background. The Company is a much enlightened employer, and offers an exceptional employment package.

CONTACT: REG HEATH on:
021-230 3781

REF. CW/10/11

SCR

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MANCHESTER 061-833 0676 FREEPOST
Freepost, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6
Freepost 6, 102, Blandford Street, London W1E 1JZ

Computing Services Association

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Experienced and Graduate
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£3000-£6500
ALL AREAS
Phone for free list of vacancies

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637 5551 day, 495 0468 eve.

FREELANCE PROGRAMMERS
BUCKS
RPG II
COMPEX
(0234) 711717

Kenya

Kenya Railways offer the following challenging opportunities at its data processing centre in Nairobi.

The provision of a complete management information service is the long term aim and recent and current developments include wagon, stock, accounting and personnel systems.

Systems Analyst/ Senior Systems Analyst

To be responsible for the design, specification and implementation of systems for an ICL 1900 computer.
(MC/126/CD)

Senior Programmer

Required for the programming in PLAN and COBOL for ICL 1904E and 1905F computers. (MC/124/CD)

Candidates, aged up to 45, must be educated to 'A' level standard and have at least 4 years relevant experience. A degree or professional qualification would be an advantage.

Salaries, which include a substantial tax-free allowance paid under Britain's overseas aid programme, are equivalent to £3565 - £8255 pa for the Systems Analyst, and £4530 - £6370 pa for the Senior Programmer. Basic salary attracts 45% gratuity.

Benefits for both posts include free passages, generous paid leave, children's holiday visit passages and education allowances, subsidised housing, appointment grant and interest-free car loan.

The terms on which civil and public servants may be released if selected for appointment will be subject to agreement with their present employers.

For full details and application form write quoting appropriate reference to

Crown Agents

The Crown Agents for Oversea Governments and Administrations, Appointments Division,
4 Millbank, London SW1P 3JD.

INTERNATIONAL BANKING

We are a major American Bank long established in London. Presently we are expanding our activities worldwide and particularly in Europe. Major data processing projects are currently being developed and more are planned, based mainly on IBM 370 and SYSTEM 3 COMPUTERS.

As a result of this activity we are expanding our International EDP Audit team and can provide excellent career opportunities for the following:

PROJECT LEADER — AUDIT SOFTWARE

To lead a small team developing audit software for IBM 370 and SYSTEM 3 banking systems. Candidates should have had project leadership experience, preferably with an IBM 370 system. Knowledge of SYSTEM 3 an advantage.

IBM 370 PROGRAMMER

Experienced in Assembler and COBOL. Good knowledge of DOS/VS important. Knowledge of IBM software and teleprocessing experience an advantage.

Both successful applicants will be involved initially with audit software development, and will eventually participate in all aspects of EDP auditing. Occasional European travel will be required.

An excellent salary will be offered for these positions, together with the usual benefits associated with a first-class bank.

Candidates, male or female, who meet the above requirements should identify the position for which they are applying and send full details of their age, education, experience and current salary to Box No. RD 4279, c/o Extel Advertising & PR Limited, Pemberton House, East Harding Street, London EC4A 3JD. The names of any banks to whom you do not wish your application forwarded should be printed clearly on the back of the envelope.

SLOUGH COLLEGE OF HIGHER EDUCATION

PROGRAMMER

required. Salary on scale to £3,512 per annum.

Please send a stamped addressed envelope for further details and an application form to

The Chief
Administrative Officer
Slough College of
Higher Education
Wellington Street
Slough SL1 1YG

UNIVERSITY OF WARWICK

ELECTRONICS TECHNICIAN GRADE 5

A Technician is required in the Department of Psychology for a wide range of electronic work with particular emphasis on interfacing microprocessor systems for laboratory measurement and control applications. Experience of circuitry would be expected to enable the successful applicant to develop in this field and qualifications to H.N.C. or equivalent are desirable. The post is permanent and pensionable and appointment will be on the scale £[illegible] p.a. (under review). Further details are available from the secretary in the Department of Psychology. Application should be made by letter giving full details to the Academic Registrar, University of Warwick, Coventry CV4 7AL quoting Ref. No. 11/21/77 by 31st October 1977.

SENIOR PROGRAMMERS

£5500 to £6500 pa

Arising from the promotion of the previous post holders, applications are invited for appointments in application development project groups. Candidates should have at least three years experience of commercial application programming, preferably with PL/1 for an IBM 370 Computer running under OS/VS. They should also be able to demonstrate the competence to lead small teams of programmers.

The successful candidates will be based at the Board's Computer Centre near the Elephant and Castle.

Applications, giving full details of relevant experience and quoting reference CW/10/SP77 should be sent to:

Mr R Burridge,
Manager, Computer Services
LONDON ELECTRICITY BOARD
PO Box No. 74, London SE1 6NL

LEB

(The above vacancies are open to male and female applicants)

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

PROGRAMMERS

BUCKS £6 ½ K

The success of this software house is all down to the high calibre staff they recruit, and is reflected in the generous salary and profit sharing incentives offered. They undertake commercial applications in the Greater London and Buckinghamshire areas. These include the development and implementation of mini and mainframe systems. If you have mini experience and are conversant in FORTRAN, BASIC, or ASSEMBLER or have IBM M/F experience in IMS, CICS and have used COBOL, PL1 or ASSEMBLER then give us a ring.

Contact Pam Quinlan

ENGINEERS to £4 ½ K

SCOTLAND

A well respected established company has recently created two new roles within its expanding communications department. The microwave engineer will specify systems according to customer requirements — a pre-sales role. Relevant design experience is therefore required, and preferably a degree or similar qualification in electronics. The technical documentation engineer will liaise with test engineers and correlate their findings to produce reference and sales information. Experience in the data transmission field is essential, supported by an HNC. Both positions require good communicators with initiative for this stimulating but demanding environment. Relocation expenses are available where applicable.

Contact Peter Gorton

SALES support Neg. c £5½K

W. LONDON based + car allowance + bonus

If you can honestly answer yes to the following questions, our client would like to hear more about you.

- ★ Able to communicate confidently and effectively at all levels.
- ★ Can work under pressure in a competitive environment.
- ★ Have experience in business commercial applications.
- ★ Flexible, adaptable and able to accept responsibility.

The successful candidate will be the computer pre and post sales support specialist responsible for new business clients in Greater London. He will of course have a solid computer background. Prospects within this expanding organisation are excellent, especially for the ambitious.

Contact Rowland Middleton

ANAL/PROGS to £6K

S. LONDON

Suitable applicants for these very attractive positions should have at least 2 years experience in COBOL programming and at least 2 years in system analysis. Personality, intelligence and a professional attitude are as important as the relevant experience, and preference will be given to applicants with a financial or general insurance background.

This multi national company is in the process of installing a 370/115 with T.P. equipment and offers plenty of scope for career development within its enterprising organisation.

Contact Rowland Middleton

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

MANAGEMENT & EXECUTIVE SELECTION

SYSTEMS PROGRAMMERS ANALYST/PROGRAMMERS

SALARY £4,500 to £7,500 p.a. with additional benefit

Alimand Management Services Ltd. have specialised with an acknowledged degree of success in Mini-Computer applications currently concentrated in the banking and financial sectors.

Following sure and steady expansion we are currently recruiting efficient and mature personnel to fill interesting and demanding assignments in the UK and the Americas. There are a range of opportunities from one year's experience upward. Tel. Graham Russell on 01-581 1234 or write: Alimand Management Services Ltd., 250 Brompton Road, London SW3 2AT.

UNIVERSITY OF MANCHESTER
REGIONAL COMPUTER CENTRE

Director Professor Gordon Black

Applications are invited for the following vacancies:

SENIOR PROGRAMMER to lead a small team responsible for the development and support of the Interactive System based on a CDC CYBER 72 running the NOS operating system. Current project areas include system performance analysis, file storage management and the commissioning of a new front-end processor. The successful applicant is expected to guide the long-term strategy for interactive computing in the University. Applicants should have a degree together with a sound experience of systems programming, preferably on a general purpose time sharing system. Experience of CDC systems would be an advantage.

Salary £5,423-£6,655 p.a. USS Ref 166/77/1/CW

TWO PROGRAMMERS required in the communications software area. The appointees will be working within a team engaged in implementing software for new protocols, participation in the Post Office EPSS project and NW Universities GANNET Network, on GE4070 and ICL 7905. Applicants should have a degree, together with a sound experience of programming in a high level and assembly language. Experience of either Real time, message switching systems or computer networks would be an advantage.

Salary for both posts: £3,333-£5,627 p.a. USS Ref 166/77/2/CW

PROGRAMMER required in the Operating Systems area. The appointee will work within a team responsible for the implementation, maintenance and development of the GEORGE 3 operating system on ICL 1906A/1904S. He/she will assist users to make efficient use of the system and trace program errors. Part of their time will be spent on the implementation and maintenance aspects of the Operating systems. Applicants should have a good programming experience, a knowledge of both Fortran and Algol and be able to communicate with computer users. A knowledge of CDC or ICL systems would be an advantage.

Salary £2,904-£4,190 p.a. USS Ref 166/77/3/CW

These posts offer the challenge of joining a progressive organisation responsible for one of the largest computer installations in Europe. Further details and application forms (returnable by November 11th) are obtainable from the Registrar, The University, Manchester M13 9PL, quoting the appropriate reference.

PROGRAMMER/ANALYST

c. £4,500 with attractive fringe benefits

Applicants are invited for a sole programmer/analyst with scope for personal initiative in a small but well organised team developing an on-line Banking package.

We are a well-established and expanding British Bank in the City.

The successful applicant, male or female, will preferably be in the 25-35 year age group with 3 years' experience in Micro/Assembler to include DEC PDP11 under RSX 11 operating systems gained in a Banking or Financial environment.

Those interested should write to:

B. M. Sterndale-Bennett
The United Bank of Kuwait Ltd.
3 Lombard Street, London EC3V 9DT

GPG PRODUCTS LIMITED DUNSTABLE

Systems Analyst

Salary around £4500

An analyst is required to join a systems development team using an ICL 2903.

The job requirements are to examine, recommend and help implement new computer based systems within the group starting in the production control areas. Development to on-line systems is anticipated.

Applicants, male or female, should have a good standard of Education, training and experience in systems analysis and a desire for responsibility and action.

Computer based systems are playing an increasingly important role in the company's administration and this position offers good prospects, job interest and the opportunity to gain valuable systems experience.

Benefits include an excellent non-contributory pension scheme, incorporating free life cover and four weeks annual holiday.

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Please write or telephone for an application form to: Miss A. Cooper, Personnel Department
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Operators to Shift Leaders £2,000-£4,000 (incl.)

LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will retrain from one manufacturer to another. Remember these positions are for shift working only. Hurry whilst stocks last. CW42/1. Annette

Systems Consultants £6,000-£9,500

CENTRAL LONDON

Seven large well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require a first rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL T/P message switching networks etc., are essential. Excellent fringe benefits and prospects.
CW42/2. Michael.

Mini Computer Programmers to £6,950

U.K.

Your experience is required now. A very large number of vacancies are registered where a knowledge of Assembler or communications experience is essential (VRC programmers would also be considered). Opportunities exist in S.W., N.W. or W. London, Surrey, Herts, and Manchester in this exciting and rewarding field. There has also been registered some overseas posts to people with 5 or more years in mini computers.
CW 42/3. Michael.

Successful Salesmen to £12K quota earnings

U.K.

We now have ten different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. They must have previous relevant small systems experience (some VRCs will be considered). All firms have bonus schemes and cars or car allowance. Most positions in S E England, but 2 in Midlands.
CW 42/4. Michael.

Hardware & Test Engineers £4,000 to £6,000 +

HERTS & MIDDLESEX

Seven companies situated around W. & N.W. London require first-rate Engineers who have mini or mainframe hardware design experience. Six vacancies also exist for Test Engineers with 16 bit and 32 bit mini experience and relevant testing background. Perks in some cases include a car and expenses.
CW42/5. Michael.

Assistant to D.P.M. to £7,500

W. LONDON

Applications are required from all round experienced analyst programmers to work for a Petro-Chemical Company using a large CDC computer. Technical experience should include COBOL and FORTRAN but most important is the ability to deal with end users and advise and design new systems. N.C.P.S. Free Life Insurance, 3 weeks' holidays.
CW 42/6. Annette.

Junior Programmers £2,500-£3,750

LONDON, HOME COUNTIES

Only one year's experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you.
CW42/7. Annette

Time Sharing Programmers to £6,000

C. LONDON

If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre- or post-sales support. Some offer generous bonus schemes.
CW 42/8. Michael.

UCA

DATA EXPRESS HOUSE
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Recruitment Consultants

01-995 3883 or
01-958 6138 evenings

[illegible]

LONDON
HILTON HOTEL
October 24th & 25th
between
Noon and 8 p.m.

IBM DOS or DOSVS Assembler Programmers

SDI would like to meet you

We shall be at the **London Hilton Hotel** in Park Lane on **October 24th and 25th**, and invite you to drop in for an informal chat.

We would like to tell you about SDI, our research and development program, and the vacancies that currently exist, both in the U.K. and abroad, for senior and junior programming staff.

We'll be there **between noon and** 8 p.m. and look forward to seeing you.

SDI

Move out and move up

If you're interested in developing your career with a progressive, expanding, computer oriented company you should consider the advantages of a move to Quinton Hazell. As market leaders in the growing replacement motor component industry, we can offer you the chance of sound career development within a major international group, added to the advantages – environmental and economic – of a beautiful North Wales coastal resort.

Don't assume that, because we are where we are, the work will be any less demanding than similar positions in major centres – it will demand an approach as professional and dedicated as any city centre outfit. Our Systems Services department provides vital support in the manufacturing, wholesaling and retailing aspects of our business through a national network of terminals linked to a 192K 1904S. We're heavily committed to the development of new projects and we're now looking to strengthen our team with keen men and women who want to grow with an expanding organisation.

Project Leaders to £6500. To lead teams of analysts in the preparation of commercial systems specifications. Must have considerable project experience and some supervisory experience. A background in leading multi-discipline project teams would be an advantage. Late 20's/early 30's.

Senior O.R. Analyst c. £5,500: O.R. Analyst c. £4,600. Providing specialist skills to multi-discipline teams and occasionally leading specialist project teams, controlling and planning the use of O.R. resources. For the Senior post, experience of inventory and distribution systems is desirable.

Operations Analyst c. £4,600. To be part of the Operations Planning Group, handling computer evaluation studies and providing an information and planning service for the day to day running of computer operations. Applicants should have thorough ICL experience on one or more of the following: GEORGE 3 OPERATING SYSTEM, COBOL PROGRAMMING, OPERATIONS ANALYSIS.

Systems Analyst and Systems Designers c. £4,600. For both production and commercial projects. A minimum of two years in a D.P. discipline, provided they display the necessary motivation and temperament. Designers should have good programming experience.

Systems Analyst. To work in the above areas. Currently earning over £3,500.

An excellent range of fringe benefits includes generous assistance with relocation. For an application form, please write or telephone

Terry Brown, Personnel Manager, Quinton Hazell Ltd, Colwyn Bay, North Wales
Tel: Colwyn Bay 44201

QH

AUSTRALIA

EDP MARKETING OPPORTUNITIES £16,300-£22,700

Datec is Australia's largest and oldest independent software house specialising in customised computer applications.

In 11 years of operation we have grown to some 110 professional staff in Sydney, Melbourne, Brisbane, Canberra, Perth and Adelaide.

Six Marketing Positions

1. Corporate Marketing Manager – New products and services to identify, research and introduce new products and services to this Computer Services Organisation. This is a senior appointment reporting to the Managing Director, and applicants should have experience in the following areas:
   - Hardware or Software sales
   - *Market Research*
   - Public Relations and Advertising

   Location, Sydney.
2. N.S.W. Sales Manager
   Although customised computer consultancy is well developed in Australia, contract work as it is practised in the UK is in its early stages. We are specifically looking for an experienced professional in the people contracting field. The right person is currently holding a senior management or sales position with one of the top UK software/people contracting companies..
3. Software Products Sales Manager
   This job involves a number of software products, including commercial applications, database and general purpose systems. We wish to recruit an experienced software products salesman to sell and support these products. He will be supported by a software products group and by our consulting division. The successful applicant will have had extensive experience in selling commercial application packages and will be able to demonstrate a successful track record in negotiating, closing and quota performance. A successful MARK IV salesman would be of particular interest. Sydney or Melbourne.
4. Small Computer Systems Division – Commercial Sales Manager
   To obtain new business in the area of commercial systems design, programming, consulting and OEM sales on minicomputers, Sydney or Melbourne.
5. Small Computer Systems Division – H/W – S/W Packages
   Datec has developed a number of highly successful commercial systems on minicomputers. There is currently a vacancy for a salesman to manage the packaging of these systems and to sell the total system (H/W and S/W) to other organisations in the same industry. *Sydney or Melbourne.*
6. Perth Branch - Sales Manager
   This position is second-in-charge to the Perth Branch Manager and is responsible for obtaining new business in the areas of consulting, contract systems and programming, and minicomputer turnkey contracts, etc.

Our founder and Managing Director will be visiting London to interview prospective candidates. Enquiries from Australians interested in returning home are also welcome. Send a brief resume (including a day and evening phone No.) to Mr. H. Douglas C/o Bartlett Jeffress Advertising Ltd, 23/28 Fleet Street, London EC4Y 1NE, to arrive by November 7th.

datec

Datec Pty. Ltd.
220 George Street,
SYDNEY N.S.W. 2000
AUSTRALIA

Due to production expansion, Cummins Engine Company Limited, a leading manufacturer of high speed diesel engines, invite applications for the following positions:

Systems Analyst Programmer

Candidates should have had at least 3 years experience as a Systems Analyst/Programmer on IBM 370 under OS using PL1, having Data Base experience and possess computing degree or equivalent.

Duties will include researching, designing and programming, also implementation of computer systems. Maintenance and reviewing of existing systems.

Applications in writing to:

The Employment Supervisor
CUMMINS **ENGINE COMPANY LTD,**
Shotts,
Lanarkshire, ML7 4JT.
Telephone SHOTTS 20291

INSTEM

INSTEM supplies computer and microprocessor based systems for a wide range of Industrial and Laboratory Automation applications worldwide. We currently require:

SENIOR PROGRAMMERS

Applicants should be of graduate level and should have several years' successful project experience utilising minicomputers. Knowledge of RSX11 and Fortran would be a definite advantage.

PROGRAMMERS

As with the senior positions, applicants should be of graduate level. However, for these positions 1-2 years' relevant programming experience will be required.

APPLICATION ENGINEERS

The applicants should have several years' experience in the design and implementation of control and monitoring systems for a wide range of industries. Up-to-date knowledge of technology, particularly in the use of microprocessors is a principal requirement.

The Company, which is a subsidiary of Kratos, is based in the pleasant country town of Stone, Staffordshire, and from our formation in 1969 we have achieved significant growth and created exciting opportunities. These posts will attract good salaries, with regular reviews offering opportunity to work in a challenging and expanding environment.

Please write or telephone (0785 83 2131)
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Stone, Staffs, ST15 8LX

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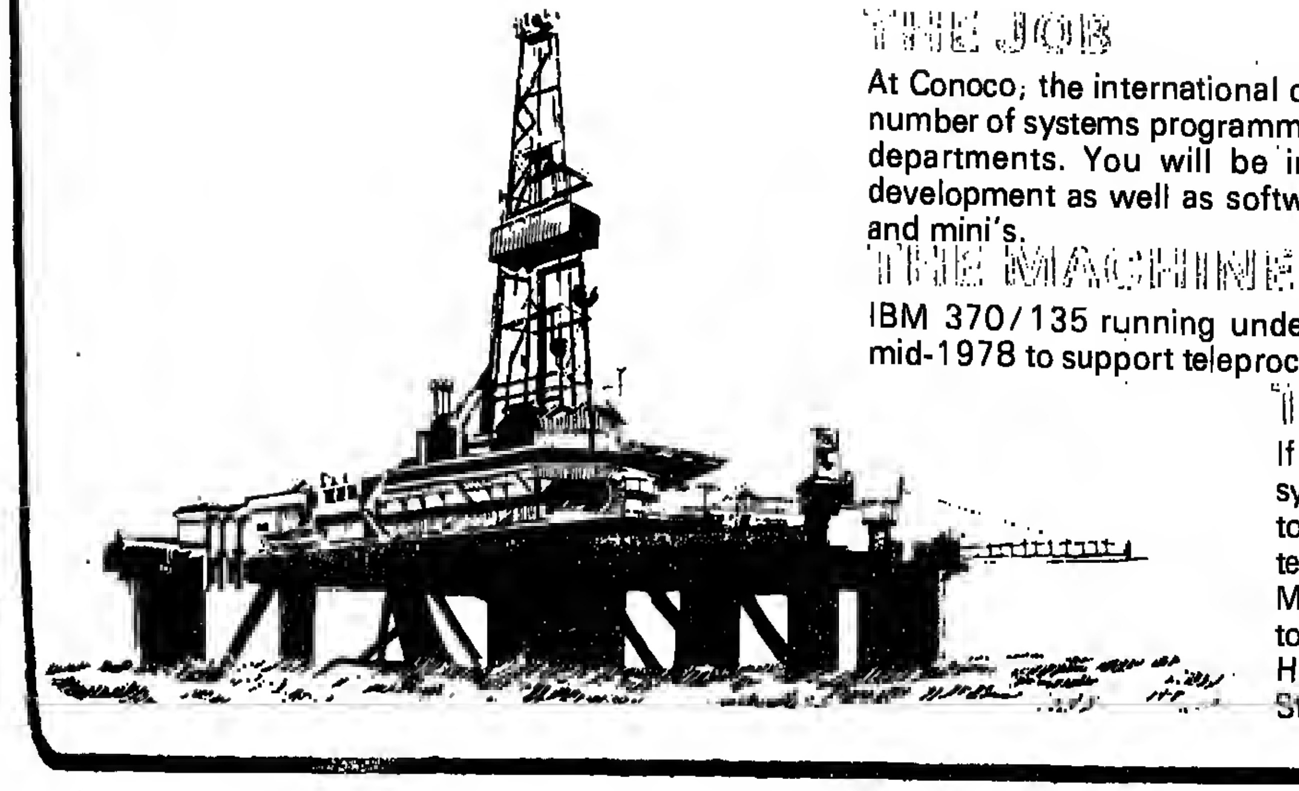
110 St. Martin's Lane, London WC2N 4BH
Telephone: 01-836 6775

DOS (VS) SYSTEMS SUPPORT £5,000+ LONDON W.1



THE JOB

At Conoco, the international oil and energy group, we have vacancies for a number of systems programmers, in our expanding Computer and Software departments. You will be involved in technical support and software development as well as software and hardware evaluation on mainframes and mini's.

THE MACHINE

IBM 370/135 running under DOS/VS. This system will be upgraded in mid-1978 to support teleprocessing real-time applications.

THE REQUIREMENTS

If you have two years' experience of IBM systems and Assembler programming and want to get involved in advanced computer technology, call our software specialist: Ciaran McGlone on 01-493 1235, ext. 3486 or write to him at: Continental Oil Co. Ltd., Continental House, London Data Centre, 105 Wigmore Street, London, W.1.

conoco

ARBAT

Systems Programmers

Central London c£5½k

To reconfigure and install operating systems software to meet special requirements and to develop and install SWIFT interface utilities and special communications facilities.

Assembler level experience is essential, ideally with a knowledge of TP or message switching.

ARBAT will give comprehensive training on their DEC PDP-11 in-house equipment plus usual company benefits.

For further information please telephone Jenny Dalrymple-Hay on 01-493 2947 (Beaconsfield (04946) 4579 evenings and weekends) or David Lawton on 01-248 6499 (04862 61091 evenings and weekends) or write to 160 Queen Victoria Street, London EC4V 4DA.

THE UNIVERSITY OF SHEFFIELD
UNIVERSITY COMPUTING SERVICES

DEPUTY DIRECTOR

Grade III: £6443-£7881 a year

Applications are invited from men and women who are graduates for the above post tenable as soon as possible. The work of the Services is divided into three areas: User Services, Operations and Systems Development. The successful applicant will assume responsibility for the Operations and Systems Development areas. Applicants should have both managerial and technical expertise. Salary on scale as quoted above plus superannuation.

Particulars from the Registrar and Secretary, the University, Sheffield S10 2TN, to whom applications (1 copy) should be sent by 11 November, 1977. Quote Ref. R43/66

COMPUTER ROOM SUPERVISOR

Applications are invited for the position of Computer Room Supervisor at our Head Office, sited on Marylebone Road, London.

The successful applicant, who must have at least two years' relevant experience, must be capable of taking full responsibility for all aspects of this operation.

Systems currently processed on our main frame computers via an RJE terminal are in the process of conversion, to be run on a recently installed C.A.I., SYFA mini computer, with implementation scheduled for early 1978. At present only one shift is worked, although it is anticipated that this may be extended.

The position offers a good working environment, together with the normal range of large company fringe benefits. Salary is negotiable dependent on experience.

Applications to: Mr. F. ANGELL, PERSONNEL MANAGER
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SERVICE ENGINEER

GLASGOW/EDINBURGH c£6250 + CAR

DatagraphiX, a subsidiary of General Dynamics, require an experienced computer/electronics engineer to service their COM Installations in Central Scotland. Applicants must have the ability to work independently and maintain maximum utilisation of the equipment for customers.

Salary is made up of a basic to £4,250 + car, stand-by allowance of over £2k, overtime, telephone, meal allowance + other large company benefits.

Telephone 031-226 5381 or forward details to ATA Computer Recruitment, Anglia House, 26 Frederick Street, Edinburgh.

MIDLANDS OPPORTUNITIES

SYSTEMS ANALYST Kidderminster c£4500

for project work on general commercial systems, a minimum of 18 months' experience in COBOL/ASSEMBLER required. 'A' levels preferred.

PROGRAMMERS Birmingham to £4000

required for mini + mainframe installations, with a minimum of 12 months' experience of any of the following ASSEMBLER, PL1, CICS, Machine Code. Also JUNIOR PROGRAMMER c£3k, preferably Graduate.

PROGRAMMER Droitwich c£4000

Aged 20/30 for Honeywell series 60 installation, COBOL essential, ASSEMBLER useful.

OPERATORS Solihull c£4000 inc.

Must have experience of ICL 1903/1905, both batch and on-line, operating 3 shift system. Applications are both technical and commercial.

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Burroughs UK is the largest member of the International Group

Sustained expansion and continuous internal promotion has created a need for new members of the sales teams.

You must be self-motivated, ambitious and capable of adjusting to the personal and intellectual demands of a rapid career progression. Self-assurance is essential as you will be negotiating with senior executives and handling selected accounts including the UK's most prestigious companies

A programme of intensive and on-going training will provide you with the professional skills to express yourself through personal effort and the determination to succeed

If you have a degree or equivalent with a systems or sales background, but find yourself not realising your full potential in your current employment, then you and Burroughs could achieve success together. Ring now for an initial interview or write to Caroline Bagley

Computer People Computer People Ref CB 8000.

PROGRAMMERS AND ANALYSTS ARE INVITED TO JOIN US FOR WINE AND CHEESE
ON MONDAY, 24th OCTOBER, 1977
5 p.m. - 8 p.m.
AT VLI HOUSE

A major communications company wish to recruit analysts and programmers to design and develop mini based systems.

Candidates are likely to have experience of mini programming and could have progressed to analysis more recently.

The opportunity is available to join small project teams working on advanced systems for external users. A positive career path will be demonstrated by candidates prepared to back their ambitions with flair and application.

Members of the management team have agreed to attend informal discussions at our offices and suitable candidates are invited to attend.

Directions: Closest Underground Leicester Square, use Cranbourn Street exit, walk to end of Cranbourn Street (30 yards). VLI House situated opposite to the right

Computer People Computer People

CAREER DEVELOPMENT IN SYSTEMS PROGRAMMING
SURREY UP TO £4500 + BENEFITS

ARE YOU already a Systems Programmer wanting new challenges and more responsibility?

OR HAVE YOU 6-24 months general computing experience and ambitions to move into software and data base work?

This *medium sized company has large-scale* computing plans, and needs people like you, with a degree or good A levels to keep up the pace of new developments. A 370/158 with VS1 and IMS already supports one of the most sophisticated on-line data base systems in the country, and you will be offered excellent training and career opportunities as a member of this highly professional team.

In addition to a good basic salary there are significant fringe benefits (such as free lunches, bonus and mortgage scheme), flexible working hours in a pleasant semi-rural location, and good sports and social facilities

StR 3000.

Computer People

PROGRAM IN DELIGHTFUL SUSSEX
SALARY—£ EXCELLENT

You will find more opportunity computer programming in pleasant CROWBOROUGH, Sussex, with Taylor Analytics, a leader in the design, development and manufacture of equipment for oxygen analysis and gas chromatography

The company has embarked on a planned steady expansion programme to exploit this specialised field, and as part of this expansion now require a PROGRAMMER with 1-2 years' COBOL experience, ideally from a commercial/manufacturing environment

Taylor Analytics offer SECURITY, prospects of PROMOTION, and BONUS based on company profitability, in addition to an *EXCELLENT* SALARY.

Ref KS 8036.

Computer People

PROCESS CONTROL IN BEDFORDSHIRE
MINI ASSEMBLER To £5000

Join a hardworking, expanding D.P. team and be part of an international manufacturing organisation using PDP 11 equipment

If you have sound knowledge of Mini Assembler, this job of Programmer/Analyst could be the position you have been looking for

Ideally, you will have gained your experience in a *process or production control environment although general manufacturing* knowledge would certainly qualify

If you are ambitious, competent and keen to become actively involved in client liaison and systems implementation, don't hesitate to apply now.

Ref. AH 2010.

Computer People

MINI PROGRAMMERS
LONDON Up to £5500

One of the leading systems houses in the U.K., now wishes to recruit a number of experienced programmers to participate in their latest development projects.

Initially you will be directly involved in specific assignments with DEC, Vantek and Data General based Systems

Experience of Basic, Cobol, Databus and Assembler in an industrial or commercial environment is essential.

The company offers a substantial career path in the consultancy area of D.P. and ambitious programming professionals will find the scope they need for advancement

Ref. DG 1000.

Computer People

IBM COBOL PROGRAMMER-SENIOR PROGRAMMER
HANTS/SURREY/SUSSEX BORDER to £5300

Our client is located on the outskirts of Guildford in Godalming.

This is an opportunity for an experienced programmer to become an integral member of a small, friendly team, utilizing sophisticated *systems* in an on line environment. The company's current installation is an IBM 370/135 although upgrading is scheduled in the not too distant future.

You should be self-motivated and capable of working with the minimum of supervision. IBM COBOL experience is essential although candidates with knowledge of Assembler or RPG II would be of particular interest. In addition to career advancement our client also offers excellent remuneration and company benefits.

Ref CB 4040.

Computer People

ARE YOU PREPARED TO BE SECURITY CONSCIOUS AND TRAVEL?
c £5000 + Mortgage + Benefits

Programmers are required to join a leading bank in London to become part of the EDP Auditing Department. The main function of the successful candidate will be to produce software to monitor the Bank's many and varied computer systems both in London and throughout Europe, the Middle East and Africa.

Candidates should be of a mature disposition, and should have the ability to programme, using Cobol. They will be required to travel abroad for about 25% of the year, and their domestic lives should not make this impossible

This is an unusual opportunity to enter the financial world at a responsible level with ample opportunity for career development. A subsidised mortgage could be made available on top of a non-contributory pension scheme, low interest loans and a generous travel allowance.

Ref. AH 2710.

Computer People

Computer People

A member of the Vivian Lanfield Investment group

Computing Services Association

VLI House 68/69 St. Martin's Lane,
London WC2N 4JS
telephone 01 240 2441

[illegible]

Computer People
VLI House 68/69 St Martins Lane
London
WC2N 4JS
Tel: 01 240 2441
Computing Services Association

SHIFT LEADER MIDDX/W. LON. CIRCA £4800 + D/T

The Subsidiary of a large European company which is situated in West London, has a requirement for a Shift Leader.

Candidates should ideally possess 4 years 370/OS experience coupled with good knowledge of OS/VS1 and its related J.C.L. Knowledge of DOS would also be an asset.

Benefits are in line with most international companies.

Ref: NA 6892.

ICL OPERATOR WITH DESIRE TO EXPAND SOFTWARE KNOWLEDGE
NO SHIFTS c£3500

The successful applicant for this challenging post will have 2 years' ICL GEORGE II operating experience with a good knowledge of macro files.

The position will appeal to someone who would like to do less operating in order to be given substantial responsibility in Data Control plus the opportunity to LEARN and APPLY FILETAB.

Candidates from either sex would be welcome, although this is currently a predominantly female installation.

Ref: KS 5125

OPERATIONS WITH A DIFFERENCE

Are you interested in progress? Then you have no option but to read on!

Our client has an installation comprising two complex 370 Machines with a unique software spooling system.

They require young operators with good knowledge of 370/OS to assist in enhancing their installation.

Salary would range between £3100-£3400, and benefits would be in line with large international companies.

Ref: NA 6052

COMPUTER CENTRE MANAGEMENT FILE CONTROLLER
EDINBURGH £5,000

This prestigious group of companies based in Scotland is fully committed to the continuing advancement of their computing techniques. To this end they are currently installing a central Honeywell Level 68/20 facility to be utilised for online data-base and batch systems.

A first-class opportunity exists for a responsible person to take a senior role as File Controller in the computer operations department.

The job involves responsibility for the day-to-day control and administration of all aspects of file allocation and data security. Additionally, the long-term planning of data management strategy will necessitate close liaison with the system development teams

Training will be provided and career prospects are excellent. Company benefits include non-contributory pension scheme and 4 weeks holiday. Relocation assistance is available.

Ref: KS 700

Interviews in Edinburgh, Manchester and London

DOS/VS POWER/VS ESSEX

If being domiciled in Essex and working in London is becoming tedious, this might be the *opportunity* you have been waiting for.

Our Client, an International Manufacturer, is currently looking for an operator with 12 months 370/125 experience.

If the idea of promotion into Programming or Systems analysis appeals to you, coupled with a salary around £3700 and additional benefits this could be the ideal post.

Ref: NA 5304

ICL OPERATOR £3,600 N. LONDON

A minimum of 1 year's experience on ICL 1900 range of equipment could lead you to our client's modern computer centre where plans to run 2900 large range computers are imminent.

You would become one of a team of operators making a worthwhile contribution to the continued success of this important expansion programme.

Big company benefits exist.

Ref: KS 6094.

SOUTH LONDON DOS/VS

Operators with 12 months DOS/VS experience, there is an opportunity in a large financial organisation for you.

If you are ambitious, fast promotion within operations or progression into Programming or Systems is obtainable.

Starting salaries are negotiable between £3700-£4200, also a benefits package is available which includes a mortgage subsidy.

Ref: NA 5341.

JUNIOR OPERATOR 2 SHIFTS £2600 S.W. LONDON

Perhaps to date your introduction to Data Processing has been limited to some Terminal Operating, and you now feel it is time to make the step into a MAINFRAME environment. Well, here's your opportunity to join a young UNIVAC 90/30 user.

- IT IS A COMPANY THAT'S RAPIDLY EXPANDING ITS BUSINESS SYSTEMS
- IT COULD BE YOUR NEXT EMPLOYER

Ref: KS 6095

SENIOR OPERATOR IBM OS/VS1
£4,500 + PERKS — CITY

An American bank who are currently moving into new areas of data processing, requires a senior operator with 4 yrs OS/VS1 experience preferably on IBM 370/145. Job control language and IBM utilities are essential, however a candidate with the right technical aptitude will be given all the necessary training needed. Promotion and progression into programming, banking or technical support is possible. Our client is also running two minis and training will be given in that area. Generous allowances are also given in-line with most banking environments.

Ref: NA 4378

SCOPE + CHALLENGE = STIMULUS FOR ICL SENIOR OPERATOR £4,100 MIDDX

Responsible for the effective operation of the computer and shift, this is an interesting opportunity to work in a lively and progressive medium-size bureau.

Candidates for this post must have achieved a good work record from a GEORGE II environment over the past 2-3 years, and have the proven ability of supervising a shift.

It is envisaged that the successful applicant will be no younger than 23.

Ref: KS 6395.

SENIOR OPERATOR £3600-£4000 HERTS

A large financial organisation situated in rural Hertfordshire require a Senior Operator.

Candidates should have a sound grounding of VS1 coupled with the ability to move into a Man Management Role very shortly.

If you feel that you have leadership qualities but no scope to develop them, this is your opportunity to do so.

Ref: NA 5450.

ICL OPERATOR c £3700 OVERTIME AVAILABLE N. LONDON

Two operators with a professional and disciplined approach to their work are much sought for our client's established 2x1904S installation.

Qualifying applicants for these key positions should have a minimum of 18 months thorough George II knowledge.

This is a good opportunity to join a large organisation which offers security as well as the opportunity to develop your career.

[illegible]

cooper computer personnel limited

READING & LONDON

The following vacancies are with a software house with units based in Reading and London, as well as in the North West. Although most of the vacancies will be based in the South, candidates with 2900 experience could be considered for future vacancies in the North.

2900 SYSTEMS

to £8,000

There are a number of vacancies for 2900 experienced staff at all levels for Applications and Software support programmers as well as systems analysts.

All candidates must have a strong programming background and must be suited to work in a customer environment. We are equally interested in COBOL programmers and technical staff who have worked on software support and have experience of VME/B, VME/K or IDMS.

Systems applicants must be able to study and define systems requirements for large 2900 Users in order to design special systems. This will include proposal writing and implementation. Senior candidates should have been involved on the successful implementation of at least one project from design to installation.
Ref. 573/CW.

DP MANAGEMENT

to £8,000

Candidates with technical experience in DP Management are invited to apply for DP Manager/Consultant positions.
The assignments will be based in the U.K., at customers' sites and will offer a variety of hardware as well as applications. We are looking for experienced personnel who have actively been involved in setting up at least one installation and have preferably worked on more than one type of hardware, including IBM, Burroughs, Univac, and ICL mainframes. They will have had a mixed background in Systems Programming as well as possibly operating
Ref. 574/CW.

To apply for any of the above positions or for further information, please telephone or write to Renee Nute and Sandy Lloyd on 01-242 9356. If it would be more convenient to telephone in the evening, the telephone numbers are: Renee Nute, 01-674 6372; Sandy Lloyd, 01-691 6168.

Computing
Services
Association

Computer Programmer

Bostrom Division of UOP Limited is the world's leading manufacturer of suspension seating for the truck, tractor and industrial equipment markets.
We are currently seeking an experienced programmer to join our small but expanding D.P. installation, which utilises an IBM System 3, Model 12.
The successful applicant will have a minimum of three years' programming experience, using RPG II, and will probably have worked in a manufacturing environment.
Commencing salary will be dependant upon age and experience, and the company offers a wide range of benefits, including 28 days' annual holiday and contributory pension scheme with free life assurance benefit.
In first instance, please write or telephone for an application form to:

Mrs. P. Cowgill
Personnel Officer
Bostrom Division
UOP Ltd.
Weedon Road Industrial Estate,
Northampton. Tel: (0604) 56621.

uop

IMPERIAL COLLEGE

POST-DOCTORAL RESEARCH ASSISTANT

required to study complexity and complexity change of large programmes. Research experience essential. Familiarity with ALGOL, Burroughs systems including MCP and Compilers, and Mathematical ability an advantage. Project has potential for fundamental breakthrough and requires initiative and innovative ability. Successful candidate will be based in London but much work will be carried out in large commercial organisation in Sheffield.
Appointment initially for one year but renewal likely. Salary on Scale [illegible] per annum plus superannuation.

Apply to Professor M. M. Lehman
Department of Computing and Control
Imperial College of Science and Technology
London SW7 2PZ

COMPUTER SYSTEMS TEST ENGINEERS

The Cable and Wireless Group is one of the leading telecommunications organizations in the world, embracing cable and radio systems, communications via satellite, telephone systems, computer and data handling.

We are continuing to expand our activities in all areas of telecommunications, and require several Computer Systems Test Engineers to join our Development and Production Department. Responsibilities will include commissioning and system testing message switching systems using PDP8 mini-computers and Multiplex equipment manufactured in-house.

Qualifications and experience should include HNC in electronics or equivalent, at least two years mini-computer experience, and systems design experience. Although not essential, some software programming experience would be an asset.

We offer excellent commencing salaries, and generous benefits including leave and pension arrangements and flexible working hours.

Please telephone or write for an application form to:

Miss Christine Morgan,
Cable & Wireless Limited,
114 Great Suffolk Street,
London SE1 0SG.
Tel: 01-928 1901 ext. 236.

Cable & Wireless

IF YOU HAVE THOUGHT OF MIGRATING TO AUSTRALIA, CONSIDER THE FOLLOWING.

CONTROL DATA AUSTRALIA has a solid record of achievement in the marketing of systems in the areas of education, scientific, wagering, government and manufacturing. In recent years, the Company has consistently achieved or exceeded all of its established sales targets. In addition, Control Data has its own Australian manufacturing facility, operates one of the country's largest and most comprehensive service bureaus, and is a leader in the marketing of advanced education and scientific systems.
CONTROL DATA AUSTRALIA requires people with expertise to work in the above mentioned areas. Vacancies exist in Melbourne and Sydney, and occasionally in Perth, Adelaide, Canberra and Brisbane. We do not intend recruiting in the United Kingdom in the near future but if you are thinking of migrating to Australia why not contact us for further information about our employment opportunities.
CONTROL DATA AUSTRALIA seeks experienced

- Commercial Analyst/Programmers (Cobol experience a must)
- On Line Real Time Network Programmers
- Pre Sales Analysts
- Systems Programmers
- Proven Systems and Bureau Salesmen
- Customer Engineers (CDC, IBM or ICL System 4 experience preferable)

CONTROL DATA AUSTRALIA offers successful applicants an excellent salary package with includes Company car or car allowance, superannuation, 4 weeks annual leave with a 17.5% leave loading, excellent working conditions and career opportunities.
If you are interested in applying for a position with CONTROL DATA AUSTRALIA please send your resume, including location preference in Australia, address and contact telephone number in U.K. to

Miss Sandra Beesley
Manager, Recruitment and Selection

CONTROL DATA AUSTRALIA PTY. LIMITED
598 St. Kilda Road, Melbourne, 3004. Telephone: (03) 51 0351.

CONTROL
DATA

404 3011

COMPUTECH SELECT-A-JOB

These are a small selection from many hundreds of current vacancies held on-line in our computer:

£7K	DEC PDP11 PROGRAMMER	London
£8K+	PROJECT LEADER - RPG2	Hants
£8K	COMPUTER ENGINEERS	Slough etc
£8K	PL/1 PROGRAMMER	Wilts
£5K+	SNR. COBOL PROG.	Kent
£5K	SENIOR PROGRAMMER	Herts
£4.5K	TRAVELLING PROGRAMMER	Europe
£4.5K	ELECTRONIC ENGRS.	W. Drayton
£4K	OPERATORS	Herts

Call us in confidence for details and interviews

COMPUTECH SYSTEMS & PERSONNEL
168 Finchley Road, London, NW3 6HP

COMPUTECH 01-794 0202

LIVERPOOL AREA HEALTH AUTHORITY (TEACHING)

Liaison Officer

Experimental Computer Project

Salary: £4,528-£5,503 per annum (Scale 9) inclusive of earning supplements

The basic function of this post is to form a communication bridge between the computer team and the staff concerned with the day-to-day management of health service functions and activities affected by the computer system.

The post offers valuable experience in both hospital management and information systems context and will be an appropriate post for career development in hospital management.

Applicants should have wide experience in hospital management and also a knowledge of computer systems. Appropriate training will be provided.

Application forms and job description are available from the Area Personnel Department, Orleans House, Edmund Street, Liverpool L3 9NG, telephone 227-4011, extension 34. Closing date: 4th November, 1977.

CITY OF BIRMINGHAM POLYTECHNIC

The following vacancies exist in the Computer Centre which operates an ICL 1902S (32K) running under GEORGE 2 and MAXIMOP.

SYSTEMS ANALYST

£4236 to £4545 + £312 + 5% (Max. £208) Supplement

A person with substantial data processing experience is required. A good knowledge of programming is essential and experience in an educational environment desirable.

CHIEF PROGRAMMER

£3825 to £4095 + £312 + 5% (max. £208) Supplement

Required for Systems Analysis, Programming, etc. Applicants should have a high degree of motivation, ability to work with the minimum of supervision, and be capable of supervising a small programming team.

Salary range £4239 + salary + £4095 + £312 + 5% (max. £208) supplement.

Further particulars and application forms (to be returned by 4th November, 1977) from:

The Personnel Officer
City of Birmingham Polytechnic
F Block, Perry Barr
Birmingham B42 2SU
Tel. 021-356 5911, Ext. 217

Systems Programmer (IBM 370/145)

AP3/4/5 — £3,234 rising to £4,407 plus Phase 2 supplement

This position is second in a team of 3 responsible for implementing and maintaining a variety of IBM and associated operating software. The present 370/145 is to be replaced by a 370/148 late next year running under OS/VS1. A TP network runs under CRJE and another under CICS. GMC Reality systems are planned early in 1978 in three district councils which will operate online to the mainframe under RES.

Applicants must have a sound knowledge of OS/VS1, JCL and BAL with a minimum of 3 years' experience. Persons with suitable previous experience may be appointed at a salary other than the minimum.

Assistance will be given with removal expenses in accordance with the council's scheme.

Application forms available from:

The County Treasurer
PO Box 2
County Offices
MATLOCK
Derbyshire DE4 3AH

Closing date:
November 11th, 1977

DERBYSHIRE
County Council

Home Counties

Our client is a well established and dynamic company with a particular interest in specialists who can contribute to the growth of a department which already has an excellent reputation in the field of Operating Systems on ICL mainframes.

They are looking for people whose long term career objective is in the field of large Operating Systems and have already had experience in programming/supporting one of the following :- GEORGE 3, VME/B, VME/K.

Excellent training will be given on 2900 facilities where necessary and successful applicants will be expected to assist with new developments, implement complete systems, analyse performance and tune the operating systems as well as to provide consultancy service to computer users, management and staff.

Senior Operating Systems Consultant £6500-£8500

Operating Systems Consultant £5500-£7500

There are plenty of opportunities to travel both in the U.K. and overseas. An assistance with relocation will be given where appropriate.

Ring Stella Mitchell immediately for discussions.

CW42/1 KINGSTON

Sales Executive

Dublin £12000 plus

on reaching reasonable target
relocation expenses
high guarantee

We have been retained by a leading International Manufacturer of medium to small computers and terminals to recruit a successful Sales Executive to sell their successful new range of hardware.

The successful candidate will have a proven track record in sales, preferably in the mini and terminal markets.

The job will have a realistic quota which, coupled with a high base salary, means exceptional rewards are possible. Relocation expenses will be covered in an excellent fringe benefits package.

Ring Gerald Delamere

CW42/2 DUBLIN

COBOL Programmers in the West End

One of the most interesting and rewarding openings for mainframe programmers in recent years has arisen.

A major international company is on the threshold of a five-year development programme and wishes to recruit the first phase of its programming intake.

Already an existing IBM user, they will have to upgrade their 370 to cope with their Data base, Real time, and Distributed Processing systems development.

This ground floor opportunity is open to applicants with a proven record of Cobol programming on any machine.

Successful candidates will enjoy the benefits of working for a company which include a competitive salary technical training, career progression into analysis and management in addition to probable overseas travel.

To secure an interview, please telephone 01-499 9214 and speak to Clive Hartrup.

CW42/3 MAYFAIR

Kingston: 44 Wood Street, Kingston upon Thames, Surrey.
Telephone 01-549 3212 (24hrs) Telex 27950

Mayfair: 5-6 Yarmouth Place, Brick Street, London W1Y 7DW.
Telephone 01-499 9214 Telex 27950

Dublin: Canberra House, 24 Lower Leeson Street, Dublin 2.
Telephone 762170/762188/785692 Telex 30742

Amsterdam: Riversidete, Amsteldijk 166, Amsterdam 1010.
Telephone 461844 Telex 11336

Computing
Services
Association

Future Systems

A team of highly technical PROGRAMMERS and CONSULTANTS is currently being sought by a large and very progressive software house. The work will stretch right across the board from development of micro based software, compilers to interactive distributive processing software and message switching to advanced applications on a variety of machines.

Programmers £5000-£6000

This is a rare opportunity for PROGRAMMERS and DESIGNERS with experience of any of the above fields who have also had at least one years' assembler experience to join at the very early stages of development and be involved with the initial design plans. ENGINEERS with micro processing background will also be considered.

Consultants £6000-£7000

CONSULTANTS who are still highly technical and have had experience with more than one range of machines, minis, or communications are urgently required. Unique opportunities also exist in an advanced micro processor-linked project.

Relocation expenses will be met where it is necessary to move to Berkshire. The company offers attractive terms, conditions and individual career prospects as well as possibilities for overseas travel. Please ring Stella Mitchell for a confidential discussion.

CW42/4 KINGSTON

PL/I
or
COBOL
PROGRAMMERS
£4,500 – £6,000

Looking to the future? We are!

Hambro Life started six years ago in 1971 – so did our computer systems. Both have expanded at an astonishing rate and we are now developing our systems to cope with the next six years.

Examples of our current projects are:

- an in-depth study of our database needs
- the evaluation of extending our on-line updating facilities
- the investigation of on-line programming techniques

Our major production systems are run in batch mode and are written in PL/I. We are, however, carefully introducing new on-line systems as the business requirements change to enable us to provide a complete service to our users.

Our installation consists of an IBM 370/145 and a 370/148 is to be added in November.

We are looking for four young highly competent programmers who:

- have 2+ years sound commercial background
- are strongly motivated to succeed and to meet difficult targets
- are willing, if necessary, to retrain in PL/I

Hambro Life is a vigorous, growth company, heavily dependent on computer systems, and provides the opportunities for career development to be in line with individual achievement. Progress within the Company is purely dependent on ability and salaries extend to £7000 for programmers who prove their effectiveness.

Fringe benefits include a generous disturbance allowance, relocation expenses to rural Wiltshire, free life assurance, non-contributory pension scheme, free membership of BUPA and a share option scheme.

For our comprehensive booklet contact

Liz Gibney
Hambro Life Assurance Limited
Hambro Life House
Swindon SN1 1EL
Tel: 0793 27812
(24 hours service; reverse charges during office hours)

HAMBRO LIFE

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CONTRACT PROGRAMMER

Immediate contract in London. 2 years' experience of IBM Cobol. Top rates

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A.B. Electronic Components Ltd.
Abercynon, Glamorgan.

COMPUTER DEVELOPMENTS
On-line Transaction Processing In A Communications Environment

If moving into the manufacturing industry, embarking on a new phase of development excites you, then you should join us.
We are recruiting for a number of positions in systems and programming in preparation for the installation of a new computer and its associated communications network of terminals in the Summer of 1978.

SYSTEMS STAFF

1. A SENIOR ANALYST is required to be responsible for our manufacturing systems. Previous experience in on-line processing is desirable but experience in a manufacturing environment is essential.
2. A number of support SYSTEMS ANALYSTS to work either in the manufacturing areas, or on financial systems also needed.

Applicants must be self motivated and capable of taking the responsibility for a particular application.

PROGRAMMING STAFF

3. A CHIEF PROGRAMMER is required to supervise and lead a small team of programmers. Experience of teleprocessing is highly desirable.
4. Vacancies also exist for programmers at different levels. One position will be of interest to a person with expertise in NEAT/3. Preference will be given to candidates with expertise in COBOL, TPS and Applications Manager.

Salary will be in accordance with experience and position. Assistance with relocation expenses will be given where appropriate.

Write or telephone for an application form to:

Staff Personnel Officer
Abercynon (0443) 740331

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datascene

MINI PEOPLE
£3500-£6500
London and Home Counties

IF YOU'RE A HIGH FLIER, NOW'S THE TIME TO TAKE OFF!
We want to hear from you now if you're a Mini-Programmer involved in technical or commercial applications.
We're particularly looking for people with experience of SINGER 1500, KIENZLE and PDP. If you have a knowledge of ASSEMBLER, FORTRAN, BASIC + OR CORAL 66, so much the better.
The job scene has never looked healthier. We have vacancies mainly with Software houses involved in business ranging from Banking to Retailing. All of them offer solid career prospects. And salaries are no barrier for the right people.

FOR FURTHER DETAILS CONTACT **01-439 7871**
24-hour answering service

Datascene Limited
Sceptre House
169-173 Regent Street
London W1R 7FB

OPERATOR CONTRACTS AVAILABLE NOW

IBM 370 OS VS
IBM 370 DOS VS Power/Grasp
ICL G I/II/III
HONEYWELL GCOS/05 2000

Also many other contract assignments in London, Home Counties and abroad. Up to £125 per week according to contract and suitability.

Ring Isobel
CO-OPERATORS
01-836 8411
A member of the VU group

EUROPEAN BANKING

With one of the world's major corporations.
Systems Integrity within Internal Audit.

PROGRAMMER/ANALYST
£6500 + benefits

London based — Considerable European Travel
After an initial assignment of three months in Brussels working on an NCR machine in NEAT/3, you will be required to ensure integrity of IBM based systems throughout Scandinavia and Western Europe.

RW 42/1

PROGRAMMER/ANALYST
$20,000+

Brussels
A minimum of three years' experience, preferably in NEAT/3 on NCR equipment, could qualify you for this exceptional career opportunity. Banking experience is not mandatory.

RW 42/2

These positions exist within one of the world's leading banks. The career opportunities within the important and vital Internal Audit function reflect the rapid growth of this eminent organisation.

ARE YOU INTERESTED IN ORIGINAL SOFTWARE DEVELOPMENT?

A series of development projects on **COMPILERS, DBMS** and **TRANSACTION PROCESSING SYSTEMS,** are currently being undertaken by the software development group of this major manufacturer of mini computers. Based just outside London, this small group has total company-wide design and development responsibility for these projects.
If you are young (less than 30), intelligent, and enjoy creative programming (or even are bored with applications work), then these positions offer an unusually stimulating environment. The working surroundings are especially pleasant. Facilities include three systems dedicated to on-line program development. You will probably have some programming experience in a low-level language, real-time environment; you might well have a Computer Sciences academic background.

Above all, you will be attracted by the opportunity to create, develop and implement *your own* ideas in these important areas of software technology. Normal big company benefits include salaries in the range:

£4000+£6500

RW 42/3

PROGRAMMERS
ANALYST/PROGRAMMERS
Up to £7000

SMALL BUSINESS SYSTEMS IMPLEMENTATIONS

IBM SYSTEM/3, SYSTEM/32, SYSTEM/34 ICL 2903/4

A major British software house is expanding its business in the area of small business systems implementation and software. This is a rapidly expanding area of business, and the company's continued growth will be constrained only by their ability to undertake and staff projects with high calibre personnel.

As a result, the company now wishes to recruit staff for their Small Business Systems Division. They will support commercial clients who plan to implement small mainframe computers for general business applications, using RPGII and COBOL as the main programming languages. Analyst/Programmers are responsible for systems design for the client, and prepare detailed programming specifications. They are expected to ensure the successful completion of projects to the client's entire satisfaction and according to agreed timescales. They will also supervise Programmers on clients' projects.

The company is one of the leading UK systems houses, established nearly ten years ago. It is backed by a substantial Industrial organisation and is therefore well placed to take advantage of an expanding market. Most of its work has been UK based but it is now looking for a growing proportion of its work to come from Western Europe.

Candidates who have not worked with RPGII or COBOL, but who otherwise meet the requirements of the job should not be deterred from applying as training can be provided.

This is an excellent environment in which to develop your creative abilities and to make a meaningful contribution to the furtherance of your own career.

Please telephone Tony Baker on 01-499 4501 during business hours or 01-445 3512 at other times to discuss without commitment these opportunities.

RW 42/4

hutchinson-scoggins recruitment
10 Dover Street, London W1X 3RH — Telephone 01-499 4501

Two more for Square One

TITLE →	Sales Executive	Recruitment Officer
	MAINFRAME DIVISION	
SALARY →	In excess of £10,000 in the first year, plus company car and expenses.	Negotiable around £5,500 per annum, plus profit share.
LOCATION →	You will be based at our Chesham Head Office but will be selling our services in London and the Home Counties.	You will be part of our Head Office staff based at Chesham.
EXPERIENCE →	You must have a good track record of successful selling in a DP environment. Experience of selling computer services would be an added advantage.	You must have a good technical background in programming or systems. Experience of recruitment would be an added advantage.
WORK CONTENT →	The mainframe division of the company provides support services to computer users. Our services include time and materials programming and analysis, fixed price projects, consultancy and facilities management. Our client base is taken from many different business sectors and includes some of the largest companies in the UK. Other divisions in the company are involved in turnkey mini systems and data preparation.	As the sales division grows, so too does the need for more systems and programming staff, both permanent and subcontract. You will liaise with sales staff to identify future needs. You will help out on advertising, interviewing and selecting staff to match requirements generated by sales staff. This may be your first step out of technical DP work or the opportunity for you to consolidate your DP experience in a personnel role.
CONTACT →	Anne Truelove at 01-734 5351 or CHESHAM (02405) 74161, or use our answering machine if you ring out of office hours. Or send details to:	Ann Truelove at 01-734 5351 or CHESHAM (02405) 74161, or use our answering machine if you ring out of office hours. Or send details to:

Square One Computer Services Ltd.
9a Market Square, Chesham, Buckinghamshire HP5 1HG

ARE YOU A CITY TYPE?

If so, you could well be interested in joining the compact and go-ahead DP unit of a large City Insurance Broking Group located in London, E.C.3 as a

SENIOR PROGRAMMER

c. £5,500

+ fringe benefits

This unusual appointment offers.

- **VARIETY** —*including both applications programming and systems analysis.*
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- **RESPONSIBILITY** —*you would be directly responsible to user departments in the Group for the development and maintenance of systems and programs.*

On behalf of our clients, we seek an articulate, presentable Programmer or Analyst Programmer with.

- *an IBM 360 or 370 background, embracing OS, JCL, COBOL and BAL*
- *a practical, business minded outlook and an interest in (or experience of) analysis work*
- *the ability to accept responsibility, work with little supervision and use initiative.*

This career opening will probably appeal to someone who would welcome working in an unrestricted, environment with the opportunity to progress.

For an initial, confidential discussion, please ring us, quoting ref. 764W, or leave a message on our answering machine if after hours.

Tel: 01-637 5796

EDP Systems
52-53 Margaret Street
London W1N 7FF

H.P.S.L. ...... H.P.S.L. ......

DATA PROCESSING MANAGER

THAMES VALLEY AREA

Our client who is a well established International Publishing Company is shortly to upgrade from a Honeywell 2020 to a Honeywell 6240. A full system revision is planned to take advantage of the facilities available on the new equipment.

A man or woman is required to take full responsibility for all aspects of the Company's Data Processing activities. He or she, who will be responsible to a Director, will have had at least four years' experience in a Senior Systems or Operations position and past performance will demonstrate ability to organise and motivate staff and to communicate with user management.

The Company is offering the usual fringe benefits and a starting salary of £6k plus according to experience.

To discuss the above vacancy please telephone Joan Lovejoy on Amersham (02403) 22201.

H.P.S.L. .... H.P.S.L.

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UNIVERSITY OF LIVERPOOL
Marine Transport Centre
Applications are invited for

FOUR POSTS OF RESEARCH ASSISTANT

to work on two S.R.C. funded projects concerned with fleet planning for containerships including the use of feeder ships and with container unit utilisation and cost functions. Candidates should be economically qualified. Familiarity with computers, knowledge of O.R. techniques and transport experience will be regarded favourably.

The posts are as follows: Two Research Assistants financed for up to one year. One Senior Research Assistant financed for up to two years. One Senior Research Assistant financed for up to three years.

The initial salary for the posts of Research Assistant will be within the range £2,904-£3,333 per annum and the initial salary for the posts of Senior Research Assistant (successful candidates for which will be of post doctoral standard) will be within the range £3,333-£3,761 per annum.

Applications together with the names of two referees, should be received not later than 10th November, 1977 by the Registrar, The University, P.O. Box 147, Liverpool L69 3BX, from whom further particulars may be obtained. Quote ref. RV/588/CW

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At least three years' experience of medium size 1900 and a good working knowledge of George II is required.

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All you need is a minimum of 12 months' experience, preferably on 1900 range and a knowledge of George II would be an advantage. Career development is encouraged by full external and on the job training as necessary. Commencing salary according to experience and ability. Good working conditions in pleasant surroundings.

There are the usual benefits expected from a successful company such as a staff restaurant, free car parking and generous discount. In addition there are benefits that many cannot match, for example, a profit sharing scheme.

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PERGAMON PRESS
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HERTS AND NORTH LONDON

ANALYSTS £4,500/£6,000
ANALYST/PROGRAMMERS £4,000/£5,300
PROGRAMMERS £3,800/£5,500

Haymarket Computing act as a DP recruitment consultancy to 35 companies in the Herts/North London area and we are currently anxious to interview **Analysts, Analyst/Programmers, and Programmers** on behalf of clients located in **Stanmore, Potters Bar, Hoddesdon, Edmonton, Enfield and Wembley.**

Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc., so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring:
HAYMARKET COMPUTING LTD.
Tel. Cuffley (Herts.) 4130
up to 7.00 p.m.

Cummins

Cummins Daventry is an expanding subsidiary of the American based Cummins Engine Company Inc. The company employs over 20,000 people worldwide, and the Daventry Plant is engaged in the manufacture of large diesel engines in the 900-1600 horsepower range. The plant has the following vacancy:

SYSTEMS ANALYST

The Department needs someone with experience and an interest in the user end of systems—investigation, presentation and implementation—and also with programming ability in either Cobol or PL/1. A background of manufacturing systems applications would be an advantage.

The company is in the forefront of technical systems development. For instance, the Systems Department utilises:

- On-line Programming
- IMS Database
- On-line Applications
- Multiple Systems Coupling

FOR THIS POSITION WE ARE OFFERING AN EXCELLENT SALARY AND CONDITIONS OF EMPLOYMENT. WE CAN ALSO OFFER GENEROUS RELOCATION ASSISTANCE.

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Cummins Daventry
Royal Oak Way South
Daventry, Northants NN11 5NU
Telephone: Daventry 4400, extension 207

Are you looking after No.1?

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Series/1 is a family of computing equipment that is small in size, flexible, powerful, and cost-effective as both a network controller and a remote work station.

With its variable storage capacity, processing speeds, and peripheral combinations, Series/1 can be compared to a collection of building blocks. You simply select the best configuration to meet the customer's needs.

Supported by software which includes PL/1, Fortran, and a real-time operating system, designed for a wide variety of real-time applications; and can be interfaced with existing equipment—OEM terminals, teletype units, graph plotters—using a range of communications protocols.

Series/1's potential is enormous. We just need the resourceful men and women—ideally graduates, to help us realise that potential. If you have practical experience in four of the following areas, we'd like to hear from you:

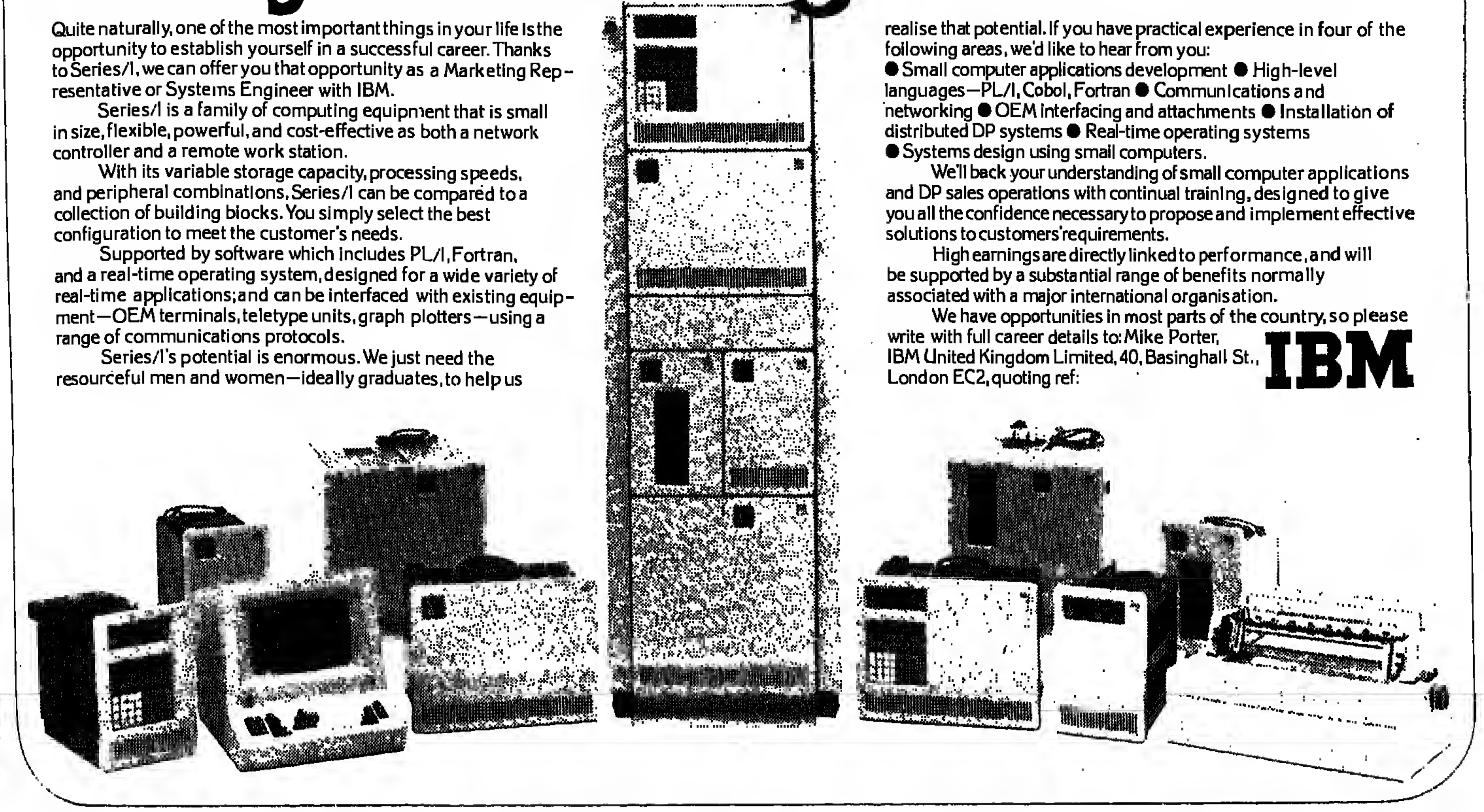
● Small computer applications development ● High-level languages—PL/1, Cobol, Fortran ● Communications and networking ● OEM interfacing and attachments ● Installation of distributed DP systems ● Real-time operating systems ● Systems design using small computers.

We'll back your understanding of small computer applications and DP sales operations with continual training, designed to give you all the confidence necessary to propose and implement effective solutions to customers' requirements.

High earnings are directly linked to performance, and will be supported by a substantial range of benefits normally associated with a major international organisation.

We have opportunities in most parts of the country, so please write with full career details to: Mike Porter, IBM United Kingdom Limited, 40, Basinghall St., London EC2, quoting ref:

IBM



Edmund Howard's Client Album

PROGRAMMERS RANGE UP TO £5,000

ON-LINE SYSTEMS DATABASE DEVELOPMENT WEST LONDON

Further development within our client's data processing centre has created two openings for self motivated Cobol programmers to assist with the development of new ON-LINE systems and DATABASE development. Although systems are disk based on Univac hardware, experience gained on IBM or other leading hardware will be given serious consideration.

Our client is a well-known international organisation mainly concerned with the production and marketing of industrial and agricultural equipment. The two appointments advertised are a realistic opportunity to develop and broaden one's current achievements within a friendly and forward thinking company. For further details please quote CW 160.

ICL OPERATORS G2 and G2+ HOME COUNTIES (WEST)

£3,900 rising to £4,300 after one year

Here is an opportunity to join a leading international organisation whose products are brand leaders in the power tool market.

Currently they require additional operations personnel with at least 16 months' experience of G2 or G2+. Systems are based on an ICL 1903T running under G2+ with on-line facilities.

The D.P. Centre is spacious and well planned, with an excellent working atmosphere. The company operates a policy of internal promotion. Other benefits include four weeks' annual holiday, a subsidised restaurant and generous discount on company products. For further details please quote CW 161.

SYSTEMS ANALYST PROJECT LEADER

SURREY c. £5,000

We are recruiting on behalf of a large independent public organisation who operate as financial, professional and commercial agent for overseas government and public authorities.

ANALYST. Candidates should have sound experience in SYSTEMS ANALYSIS along with four years' programming encompassing on-line systems. A knowledge of Honeywell equipment would be advantageous.

PROJECT LEADER. Candidates' experience should be similar to that of the analyst appointment (paragraph above), coupled with management and leadership skills having a minimum of five years' overall data processing experience. Currently systems are Honeywell 1200 based progressing to a Honeywell level 66 next year. For further details please quote CW 162.

SENIOR PROGRAMMER

SALARY c. £6,000 p.a.

LONDON, SW1

A highly specialised consultancy is currently seeking an experienced senior programmer to assume total responsibility for the company's commercial programming activities.

The successful candidate should possess a sound knowledge of Cobol coupled with in-depth experience of the IBM DOS Operating System. An ability to deal with personnel at all levels is essential. Additional duties will include providing technical support to the operations team to ensure that objectives are met within the timescales laid down.

This is a key position for someone with the right qualities whose background combines both skill and professionalism, in keeping with the company's fine reputation for providing a good and efficient service. For further details please quote CW 163.

Edmund Howard & Partners
Computer Personnel Consultants
[illegible] Surbiton, Surrey. Telephone [illegible]
34 Grafton Street, Dublin. Telephone [illegible]

The trouble only began when ... was installed in

● Submitted by Peter Williams, of London, who wins

PRINT

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Can you work entirely on your own or perhaps lead a project team? Our client's requirements are so many and varied in almost all manufacturing and service industries. We can offer long-term contracts to individuals who have the ability to liaise with senior management, writing high level business systems specs while still appreciating the problems of implementation. Ideally on ICL, IBM and/or other large mainframe hardware. It is important that you have the ability to program in COBOL or PL/1, though generally it would not be expected of you.

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We have many vacancies for career minded operators who wish to move into the junior management position. Ideally you will have a minimum of 2/3 years IBM DOS or perhaps ICL GEORGE background — but we can also assist operators with Honeywell, Univac or Burroughs experience.

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Computer Specialists & Systems Analysts have great potential for DP sales. Agreed?

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NCR is an international Company operating world-wide. With millions of pounds invested in computer development.

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We'll take a phone call or you can write for an early interview to: —
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NCR Limited, 206 Marylebone Road,
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NCR

Real Time Software

For Programmers, Analyst/Programmers, Systems Analysts, Project Leaders.

SYSTEMS & APPLICATIONS	Data logging, telecontrol, supervisory control systems, monitoring and display, telemetry, plant control, etc.
MACHINES	Hewlett Packard 21MX, PDP11-04 to 45, Data General Nova, Intel 8080.
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OPERATING SYSTEMS	RSX11 M & D and in house specialist operating systems.
LOCATIONS	Chippenham, Wiltshire and Wokingham, Berkshire.

KEEP AHEAD WITH THE LEADERS
WESTINGHOUSE
Brake and Signal Co Ltd Chippenham Wilts

Generous relocation and removal assistance will be given where appropriate. For application form and/or further details please telephone or write to Mr. R. P. Leno, Personnel Officer on Chippenham (0249) 4141 extension 148.

PLAN Programmer

to be retrained for development work in COBOL

LONDON, W1 £5000 +

This is an excellent career opportunity for a PLAN Programmer to work initially on ICL 1900, and to be retrained in 1978 for COBOL development work on a major ICL 2900 configuration, using DATABASE (IDMS) and extensive REAL TIME applications. The installation is convenient for tube and bus services, and no travel on the job will be required.

This opening will interest programmers with upwards of two years' experience, including sound PLAN, COBOL and GEORGE 2 would be valuable, but are not essential.

We have been retained by clients to recruit for this appointment. For an initial confidential discussion, please ring us, quoting ref. 757. Messages will be recorded after hours.

Tel: 01-637 5796

EDP Systems
52-53 Margaret Street
London W1N 7FF

MIDDLE EAST
2 year Contract
To 27,000 dollars tax free.
A/PROG.—COBOL/CICS
PROG — PL1 and COBOL
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Knight Programming Support
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Tel. 01-734 0152/3010 (24 hrs.)

SYSTEMS ANALYST/ SENIOR PROGRAMMER

£4900 - £6400

The Central Electricity Generating Board invites applications for the above position at its Computer Branch.

The Computer, a 192K I.C.L. 1903T is at Bramhall, Stockport, but this job may take you on lengthy assignments elsewhere e.g. North Wales or North Lancashire. You will be part of the station liaison team providing a computing service to power stations, using both the 1903T and their own equipment (Ferranti, G.E.C., D.E.C.). You should have had considerable experience of COBOL or FORTRAN, Operating Systems, Direct Data entry and enquiry systems and be capable of designing, specifying and implementing small systems.

A knowledge of real time logging and control applications would be an advantage.

Minimum qualification required — 'A' level Mathematics.

Applications in writing from either sex giving details of age, experience, qualifications, etc., to the Personnel Manager, CENTRAL ELECTRICITY GENERATING BOARD, Europa House, Bird Hall Lane, Cheadle Heath, Stockport, Cheshire SK3 0XA, to arrive no later than 2 November, 1977.

Please quote Vacancy number 339/CW.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

SENIOR ANALYSTS

S.E. HERTS £6000

Opportunities for Senior Systems Analysts have been created by an increase in new projects in an advanced installation using mainframes and minicomputers.

The company is involved in the use of Distributed Processing techniques and in the development of sophisticated systems using a Database and Teleprocessing facilities. The use of financial models is to be investigated. There is also a variety of commercial systems including Stock and Distribution applications. Future hardware and software requirements are being assessed.

Applicants should be able to offer sound systems analysis experience. Successful candidates will be given the opportunity to develop their skills, both of a technical and leadership nature.

The location is also very accessible from many areas of West Essex and North London. Terms of employment and fringe benefits are excellent.

PROGRAMMING STAFF

At least 2 years' experience

WEST LONDON
IBM 370 OS

Senior c £5250
Systems c £5500

We are seeking capable PROGRAMMERS keen to enhance their career by a move to either a SENIOR or SYSTEMS PROGRAMMING role as a member of a newly formed team. The installation is implementing several new Systems with a development plan covering the next three years, including both communication network and database applications.

You are likely to have either sound applications experience using COBOL or, for the Systems Programming vacancy, a knowledge of IBM Software. An appreciation of manufacturing systems and an ability to communicate at all levels would be an advantage.

The salary and benefits package are commensurate with experience and will be in line with those given by a major International Company.

IBM SYSTEM 32 SPECIALIST

Permanent or Contract

CITY TO £6500

A London based financial organisation with branches throughout the world is seeking a person with in-depth knowledge of IBM System 32 issues.

The person appointed will play a major part in the development of branch systems, using a distributed network of System 32's, and can look forward to the opportunity of limited travel to countries in Europe.

Candidates must be experienced in the analysis and programming of applications on System 32's.

The Company is prepared to offer the successful candidate a permanent position within the Computer Department which offers excellent career prospects, or if preferred a twelve months contract can be established with the possibility of extension.

ANALYST

CITY c £5750

A systems analyst with sound experience in commercial systems design and an ability to progress towards project control is required to augment an active team in the City.

Candidates will be used to functioning in a team environment, working to good standards supported by comprehensive documentation. A background in programming would be an added advantage.

The successful applicant will be involved in unusual and interesting applications and will have the personality to establish good working relationships with user department personnel at both junior and senior level.

Conditions of employment are excellent, the company offer a comprehensive package of benefits.

Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 5868

Three open invitations to find out about the very latest software developments.

Liverpool
REAL ALE
The Adelphi Hotel, Ranelagh Place, Liverpool L3 5UL. Wednesday October 26th, 12 noon to 9pm.
Radlett
The Red Lion Hotel, Watling Street, Radlett, Herts. Wednesday November 2nd, 12 noon to 9pm.
REAL ALE
Southsea
The Pendragon Hotel, Clarence Parade, Southsea. Thursday November 3rd, 12 noon to 9pm.
REAL ALE

If someone asked you as a Software Specialist where the very latest software developments were happening, what would you say? With one of the big mainframe manufacturers? In some US research centre?

You'd probably be surprised to hear that the answer's 'at STL', the ITT Corporation's chief European research centre, a centre principally involved in the research and development of telecommunications.

And if you'd like to hear more about those software developments behind the communication systems of the future, now is a very good time to do it because some of the senior computer specialists from STL are travelling round the country to three venues in the next few weeks to meet Analysts and Programmers — and tell you at first hand about the exceptional career opportunities we have for men and women with a degree or equivalent and at least two years' experience in real-time programming, operating systems and technical DP or — for microprocessor work — knowledge of 8080a, high level languages and telecomms systems. There are vacancies at several levels in these areas: **advanced computer aids for development of software associated with new products; design and layout for LSI chips and PCBs; circuit analysis and simulation; development of test languages; automatic generation of test sequences; and the new applications of microprocessors – real-time systems control, process control, software research.**

You'll also be able to see with the aid of an audio-visual presentation all the advantages there are in living and working in and around Harlow, an essentially rural area on the Herts/Essex border where housing is readily available and attractively priced, both in the town itself and in the villages which surround it. And London is near enough if you need it. The people you'll meet will be able to tell you all about it.

If it's not convenient to meet us on these dates, please write or telephone Vaughan Hartridge, Standard Telecommunication Laboratories Limited, London Road, Harlow, Essex CM17 9NA. Tel. Harlow 29531, extension 361.

STL

ANALYST/PROGRAMMER

Salary Circa £5,000

Company

Gainsborough Fabrics Ltd is a member of the international Carrington Viyella Textile Group engaged in the production of warp and weft knitted fabrics for apparel and industrial end uses. It is situated in rural Suffolk and is the headquarters site of the Knitting Division

Job

As our Computer operation is at present being redesigned a challenging opportunity exists for a person who has initiative and is adaptable to gain valuable experience in this phase of development. The applications of our operation are in the production, commercial and accountancy areas.

Person

Applications are invited from persons with a minimum of 'A' level education together with 3 year's Cobol experience and 2 year's Systems Design, preferably in an industrial environment.

Benefits

A salary, which is negotiable at circa £5,000 together with an attractive fringe benefits package offered and relocation expenses will be paid where appropriate.

Write or telephone for application form to:

G. R. G. Bell, Personnel Manager
Gainsborough Fabrics Ltd.
Radiator Road, Great Cornard, Sudbury
Suffolk CO10 0HY

Gainsborough Fabrics LTD
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systems programmers analysts analysts/programmers

Brussels

Our Information Services Operations in Europe are expanding rapidly. At present we have IBM systems in the U.K., France, Germany, Sweden, Italy, Spain and Belgium, a European headquarters installation in Brussels, and a link to corporate headquarters in Deerfield, Illinois.

We need data processing professionals with proven records of success who want to join a fast-growing company operating internationally.

Location is Brussels. Salaries and potential are excellent.

Write with full c.v. to:
IAN GILLIES, Director of IS, Travenol International Services Inc., chaussée de La Hulpe 130, B-1050 Brussels (Belgium).

Interviews with selected applicants will be held in London shortly.

TRAVENOL INTERNATIONAL SERVICES INC.

ANALYST PROGRAMMERS

MANCHESTER

TOOTAL LIMITED is a large international group involved in all aspects of textile manufacturing and marketing.

The data Processing Department of Tootal provides a bureau service to the member companies of the Group, based on ICL 1903T and 1904A with a network of 60 terminals.

Further extensive systems involving Teleprocessing and Database are under development, and Analyst Programmers competent in Cobol are required to join existing project teams. A working knowledge of Plan will be an additional advantage. To fill these vacancies, candidates will need a minimum of three years' experience developing general D.P. applications.

Benefits include first-class technical training, a Group Pension Scheme, and flexible working hours. Salaries will be negotiated according to experience.

Please write giving details of age, experience and present salary to:

The Group Appointments Manager
TOOTAL LIMITED
56 Oxford Street, MANCHESTER M60 1HJ

CONTRACT PROGRAMMERS
LONDON
IBM 360 OS
COBOL
COMPEX
(0234) 711717

Borough Treasurer's Department

Systems Programmer

S.O.1. £5,044-£5,350 p.a. inc.

We need an experienced programmer with the flair to recognise the areas of potential development within our computer systems, and the skill to carry them out. The successful applicant will be required to assist in the researching and testing of new software.

Knowledge of ICL PLAN and COBOL is essential. Working with a minimum of supervision you will be involved with GEORGE 2+, Rediton-Seecheck and ICL Dataview. Experience in these would be an advantage.

Application forms from Personnel Officer, Town Hall, Forest Road, Walthamstow, London E17 4JF (Tel: 01-531 8888 — 24-hour answering service).

Closing date: 4th November, 1977. Please quote ref. S.666

London Borough of Waltham Forest

TOP JOBS FOR TOP PEOPLE

SURVEY ANALYSIS MANAGER **to £6,000 p.a.**
The WEST END offices of a nationwide Bureau Operation has an immediate requirement for a professional person to take charge of a small department in Media and Market Research applications. The ideal applicant will be aged around 30 and possess a good systems and programming background, but will primarily be a first-class Manager. This position would probably be particularly suitable for someone who is currently DP Manager of a small mainframe installation and is looking for the opportunity to broaden their experience within a more sophisticated environment. A knowledge of IBM Equipment and FORTRAN would be a considerable advantage, as would some previous involvement with Market Research applications, but this is by *no* means essential.

SENIOR ANALYST/PROJECT LEADER **to £6,500 p.a.**
A major consumer organisation with its DP Operation based in a pleasant area on the HERTS/ESSEX BORDER is currently looking for a Senior Systems Analyst to fulfill a Project Leader function. The successful person will have solid commercial analysis experience with a good knowledge of on-line or distributed processing investigation. He or she will be responsible for a team of analysts and programmers and will be expected to work largely on his own initiative.

Opportunities also exist for **JUNIOR ANALYSTS** or **ANALYST/PROGRAMMERS**, wishing to progress into pure systems work. Salaries c. £4,500 p.a.

FLIGHT SIMULATION EXPERT FOR THE U.S.A. **£ Neg.**
If you have a minimum of 3 years' design and programming experience on engine simulation and flight systems with a solid grounding in **PDP 11/45 ASSEMBLER,** then this is your chance to see a bit of the world at someone else's expense. You will be based in the States for at least six months, with all expenses paid and a flat provided, after which, there will be an excellent position available in the U.K. should you desire.

Starting salary for this one is negotiable and will pose no problem for the right person.

PROGRAMMING CONSULTANTS **c. £6,500 p.a.**
A major Computer Services Company located on the BUCKS/HERTS BORDER has an urgent requirement for professional Programming Consultants with the following experience.

MINI COMPUTER SOFTWARE people with compiler writing experience, and **MINI COMPUTER APPLICATIONS** people with experience of FORTRAN, BASIC, etc., to work on DEC, Hewlett Packard and Data General machines operating on a turn-key basis with minimal travelling involved.

The same client would also be interested in hearing from people with 2 or more IBM languages and TP/DATABASE experience to work on client's premises in and around the LONDON AREA.

COBOL PROGRAMMERS — EVERYWHERE **to £5,500 p.a.**
If you are an experienced COBOL Programmer you have never been more in demand than you are at present.

Here is a very small selection of the opportunities currently available:

E.C.2	2 yrs + ICL experience for 2903 installation
W.8	BURROUGHS COBOL — to learn Database techniques
MID ESSEX	2½ yrs. ICL experience — prospects to analysis
N.11	1 year + COBOL any hardware, for large R.T. System
SUSSEX COAST	18 months' + IBM OS experience
E.C.4	18 months' + any Cobol to learn IBM

Remember, this is only a SMALL selection, so if none of the above quite fit the bill for you give me a call anyway to see what else is going.

CONTRACT PROGRAMMERS ***to £200 per week***
I urgently need people with the following experience for immediate starts.

PDP 11 MUMPS	C. LONDON	RPG II any machine	HERTS
Ventek Mini	W. LONDON	H. COBOL OS 2000	W. LONDON

OS COBOL on-line banking experience ess.: NEW YORK

I also need 10 people with COBOL CICS and DL/1 to start January '78. C. LONDON.

For further details of any of the above vacancies, or for information regarding other positions, phone SARAH SMITH

MARTON associates

هكذا في الأصل

FOR COMPUTER PEOPLE AT THE CROSSROADS
206/210 Bishopsgate, London EC2M 4NR
01-283 3237

GRAMPIAN REGIONAL COUNCIL
DEPARTMENT OF FINANCE

COBOL PROGRAMMER

REF. 527/7

Present ICL 1902 T to be replaced during 1978 by an ICL 2960 with ¼ Mb store, 6 Mr, 4 x EDS 200 and 2 x LP1500

Salary scale A P. Grades 11/111 - £3,096 to £3,825 per annum, with possible progression to £4,395 plus Phase 1 and Phase 2 supplements, *with placing according to qualifications and experience.*

Assistance may be given with removal and legal expenses in appropriate cases

Application forms may be obtained from the Personnel Officer, Woodhill House, Ashgrove Road West, Aberdeen AB9 2LU. Closing date for applications 31st October, 1977.

IBM & ICL OPS.
2 shift only
£3600 + p.a.
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(24 hours)
EFFECTIA GRAVIS
Personnel Consultants

HIGH RATES
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LEICESTER POLYTECHNIC
Computer Centre

INFORMATION & ADVISORY OFFICER

£4236-£4545 plus pay supplements of up to £620 p.a.

This is a senior post concerned with leading the full range of information services available to users of the centre, involving documentation, training and advisory functions. Applicants should preferably hold a degree or similar, and have appropriate experience.

Further details and application form available from Staffing Officer, Leicester Polytechnic, P.O. Box 143, Leicester [illegible]

CAPITAL APPTS.
COMPUTER SERVICE ENGINEERS
Phone for free jobs lists all areas
SALARIES TO £6,000
34 Percy St. *London W1*
637 5551 day: 445 0968 eve

Systems Analyst

Large International Bank
Salary: c £6,000 plus mortgage subsidy

Initially, this position will be based in Frankfurt and London and the successful applicant will be expected to commute for approximately 6-8 months to Frankfurt on a weekly basis. Thereafter, the position will probably be based in London.

We are looking for a person who may now be working as a Systems Analyst or as an Analyst/Programmer and who is looking for a position which offers a more interesting career step. A logical and organised approach to work is as important as a technical background. Experience in the use of File Structures and Design, Information Retrieval Techniques and File Access methods would be a considerable asset, so would a knowledge of mini computer equipment. A knowledge of banking practices would be an advantage although this is not essential.

His or her first assignment will be to set up and maintain a system to control data definition and their use within our client's computer system. In the longer term, it is intended to maintain data definitions on a computer based Data Dictionary and to use this as the major reference source and control. He or she will be responsible for establishing and controlling this interface also.

The position is an extremely important one with considerable responsibility, and is based within a successful and dynamic systems environment.

Please contact John Goldsmith quoting reference no. 959.

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER

Computing Services Association

John Goldsmith
(Computer Recruitment) Limited,
15 Buckingham Palace Road, London, SW1.
Tel: 01-828 5356 24 hour *answering service.*

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CONTRACT UK

- High Income Contracts through R.T.Z. Computer Services.
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- Mini or mainframe experience required.
- Contracts for Operators, Programmers and Analysts throughout U.K.

R.T.Z. Computer Services Limited,
103 Jermyn Street, London, SW1Y 6EH.

RTZCS 01-930 4163

LONDON SCHOOL OF ECONOMICS

RESEARCH OFFICER/ASSISTANT

Two posts. One to be responsible for the computing aspects of a project on retirement behaviour, the other to work on a project on income distribution and incentives — both in collaboration with other programmers and members of the Economics Department. Both jobs involve handling large survey data sets. Some statistics an advantage. To start whenever available. Appointment as Research Officer within range £3377-£6077 p.a. (including London Allowance) or *Research Assistant within* range £2698-£3510 p.a. (including London Allowance) depending on qualifications and experience.

Applications to Miss P. Mounsey, Centre for Labour Economics, London School of Economics, Houghton Street, London WC2A 2AE (Tel: 01-405 7686) as soon as possible.

William Key & Partners Limited

COMPUTER SYSTEMS ENGINEER

MANCHESTER

KRATOS Ltd manufactures the DS50 and DS300 ranges of data systems which provide real time processing of data generated by scientific instruments

KRATOS now needs a COMPUTER SYSTEMS ENGINEER to be responsible to the Data Systems Product Manager for the specification, procurement, checking and installation of the system hardware.

Applicants for the post should have:

- ★ Sound knowledge and practical experience of mini-computers using high level operating systems.
- ★ Minimum of 2 years' experience of installation and/or commissioning.
- ★ A degree or equivalent in Computer Sciences.

A competitive salary is offered.

William Key & Partners Ltd. have been retained to fill the above post. Please write with brief details or telephone for an application form: Lis Segal, William Key & Partners Ltd., 504/505 Corn Exchange Buildings, Corporation Street, Manchester M4 3DD. 061-834 2271 during office hours, or 061-928 5405 at other times. Ref: CW 0506.

BOROUGH OF HYNDBURN
Borough Treasurer's Department

COMPUTER PROGRAMMER

AP.2/3 £2529-£3282 + £312 salary supplement, + phase 2 supplement

The Council operate an ICL 1901A with tapes and discs. Candidates must be experienced in COBOL.

Assistance will be provided with removal expenses, and provision of housing accommodation, in approved cases.

Application forms and job descriptions available from the Personnel Officer, Town Clerk's Department, Municipal Offices, St. James Street, Accrington, Lancs. BB5 1PG, to whom they should be returned not later than 7th November, 1977. Ref. 141.

Canvassing of Senior Officers or Members of the Council will automatically disqualify.

ANALYST/PROGRAMMERS

Head Office Development for Overseas Branches

Circa £6000 plus benefits

Lloyds Bank International requires additional analyst/programmers for its overseas development and support group within its Computer Services Department, based in the City, to work as part of a small highly skilled team.

The job is to assist in the development of generalised Banking Computer Systems which are to be installed on IBM System 32 and 34 computers in overseas branches of L.B.I. The work will be carried out in London but opportunities for overseas travel may occur from time to time

Ideally candidates will be in their mid-twenties, be well educated, probably to at least 'A' level standard and should have had at least four years' experience either as a programmer or analyst/programmer preferably using IBM System 3 or 32 computers in a banking environment.

The starting salary will reflect age and experience but it is unlikely that anyone currently earning less than £4600 would have the desired qualifications and experience. The position offers very good career prospects.

Interested applicants should write or telephone, stating qualifications and experience, to Simon Wootton, 01-248 9822, Ext 338

LLOYDS BANK INTERNATIONAL
40-66 Queen Victoria Street, London EC4P 4EL.

THE UNIVERSITY OF SHEFFIELD
UNIVERSITY COMPUTING SERVICES

CHIEF SYSTEMS PROGRAMMER

Grade II: £6423-£6896 a year

Applications are invited from men and women who are graduates for the above post, tenable as soon as possible. The successful candidate will lead a team of six systems programmers. Expertise in systems programming and management of other programmers required. Salary scale as quoted above plus superannuation.

Particulars from the Registrar and Secretary, The University, Sheffield S10 2TN, to whom applications (1 copy) should be sent by 11 November 1977. *Please quote ref R44/BB*

THE UNIVERSITY OF SUSSEX

DATA PROCESSING FOR THE ADMINISTRATION

A PROGRAMMER

is required as soon as possible to work *in a small team on the maintenance and* development of financial data processing systems for the Administration. Applications are invited from experienced programmers (preferably graduates) who are interested in getting results and providing user satisfaction over a wide range of systems. Programs are written in PLAN, COBOL, FLT8 and Filetab and run on an ICL 1904S under George 3.

Salary will be according to experience and qualifications on a scale up to a maximum of £4,611 p.a.

Application forms from the Staff Records and Recruitment Officer, Sussex House, University of Sussex, Falmer, Brighton BN1 9RH

SALES OPPORTUNITIES

BUREAU SALES — Basic c£5k on target £8k + car London/Home Counties.

MAINFRAME — c£9k + prestige car London.

MINI SALES — £8k + comm + prestige car. Mini experience preferred.

SALES SUPPORT — Mini computers c£5k Home Counties.

For further details please telephone
G. B. TECHNICAL SERVICES
(Consultants)
170 Piccadilly, London W1
01-499 5308

The Polytechnic of North London

LONDON POLYTECHNICS COMPUTER UNIT

Systems Programmer or Senior Systems Programmer

The hardware
ICL 1905E (96K) with discs and magnetic tapes, cards and paper tape, graph plotter, 7020s; plus access to a Dec-10.

The software:
George 3: Fortran, Algol 60, Cobol, Plan, Algol 68, etc. and application packages.

The job:
Software maintenance and enhancement, user support on both computers, documentation, applications programming, hardware and software evaluation.

Qualifications:
Degree or professional equivalent. Familiarity with 1900s or Dec-10s and experience with micro-processors would be an advantage.

Salary:
On scales up to £4288 for a Programmer and up to £6068 for a Senior Programmer (including London Weighting and earnings supplement) depending on previous experience.

Further details and application form from Head of LPCU, Polytechnic of North London, Holloway Road N7 8DB.

Computer Operators

£3,500 including Shift Allowance

Vacancies have arisen at our Prescot Centre on Merseyside for experienced computer operators (male/female) with a minimum of 18 months' *experience on* ICL 1900 equipment. George III knowledge preferred.

The department operates a 3 shift system using a 256K 1904S equipped with direct access and on-line George III data communications facilities. Conditions are attractive and commensurate with a *large multinational company.*

Applications in writing to:

L. Barker
Personnel & Administration Officer
Group Management Centre
BICC Limited
P.O. Box 1, Prescot
Merseyside L34 5SZ

BICC

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oxford polytechnic

Department of Mathematics Statistics and Computing

LECTURER/SENIOR LECTURER in DATA PROCESSING

Salary (£3,744 — (bar) — £6,909)

To teach Data Processing and Systems Analysis on HNC and HND Computer Studies courses, the Data Processing *elements of the Modular Degree course* and to be involved in the range of basic computer studies teaching. Applicants must be graduates having studied computing formally to some extent and have relevant industrial experience.

Further particulars and application form may be obtained from the Dean of the Faculty of Technology, Oxford Polytechnic, Oxford, OX3 0BP, to whom applications (including the names of referees) should be submitted by 28th October, 1977.

Operator

c. £3,000 plus

We are part of an International Organisation using an IBM System/3 Model 10 which will be upgraded to a *large Model 8 with teleprocessing later this year.*

We require a Computer Operator to join our small but successful team.

Applicants will probably be in their early 20's with a minimum of 12 months relevant experience ideally but not essentially on System/3.

Salary will be around £3,000 per annum, *plus other big* Company fringe benefits.

Please contact: P. Gayerk
PLOUGH (UK) LTD.
Penarth Street, London SE15 1TR
Telephone: 01-639 4363

THE SALES BIT

Watch your tongue

TRAVELLING AND DINING with colleagues and clients often presents an excellent opportunity for discussing important business matters. Perhaps the implications of the new equipment you are about to install; the opening of a new branch office; the highlights of your prospect portfolio; or the details of an important proposal.

Unfortunately, whether travelling first or second class, dining at the Ritz or Joe's Caff, there is no way of assessing whether you are in the company of disinterested bystanders or fascinated competitors.

Several years ago a friend of mine, and a significant personality within the history of the UK computer industry, needed to buy air conditioning equipment for a substantial installation.

During the journey to London my friend was intrigued to overhear the conversation of two men who were leaning over a large blueprint on the table opposite.

They were discussing their tactics for a forthcoming meeting. What they would say when they arrived, who would handle what aspects of the conversation, their opening and bottom prices, making such remarks as "We'd better not mention that" and "That's not as good as it might be."

Later that day my friend saw the first of the contenders for the new air conditioning equipment, and who should be their representatives but — you guessed it — the two men on the train! Right, and you guessed it again! They didn't get the business.

The implications of having business conversations overheard are fairly obvious; yet people continue to do it, both senior and junior personnel alike, even though such carelessness could easily result in the loss of a forthcoming sale or an existing client.

So, if you must discuss your business publicly, keep it quiet, use no proper names of companies, products or personalities; and make it brief.

Conversely, if you are travelling or dining alone just listen to the world around you. The loose talk of other people is fair game.

And next time you visit the pub with the lads from the office, just think about all those clients, potential clients, competitors, journalists, recruiting agents, government officials and divorce detectives who might be in there with you.

Trader

Puzzle answer

GIVEN one side x of a right-angled triangle, and the difference d between second side and hypotenuse, then

$$\frac{x^2}{2d} + \frac{d}{2}$$

equals Length of Hypotenuse. This makes AC 25.5 in our particular case.